INL/EXT-17-41922

2016 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 25)

June 2017

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Idaho National Laboratory
Idaho Falls, Idaho 83415

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ABSTRACT

This *2016 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 25)* provides water use information for production and potable water wells at the Idaho National Laboratory Site for Calendar Year 2016. It also provides detailed information for new, modified, and decommissioned wells. Four new wells were drilled and completed in Calendar Year 2016. Five storm water injection wells were decommissioned in Calendar Year 2016. Detailed construction and decommissioning information and location maps for the wells are provided.

This report is being submitted in accordance with the Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy (dated 1990), the subsequent Partial Decree for Water Right 34-10901 issued June 20, 2003, and the Final Unified Decree issued August 26, 2014.

CONTENTS

FIGURES

TABLES

ACRONYMS

ATR Complex	Advanced Test Reactor Complex
bbc	below brass cap
bls	below land surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CITRC	Critical Infrastructure Test Range Complex
CWI	Comprehensive Well Inventory
CY	calendar year
INL	Idaho National Laboratory
ISB	in situ bioremediation
INTEC	Idaho Nuclear Technology and Engineering Center
MFC	Materials and Fuels Complex
NRF	Naval Reactors Facility
RWMC	Radioactive Waste Management Complex
TAN	Test Area North
USGS	United States Geological Survey

2016 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory (Revision 25)

1. INTRODUCTION

This *2016 Idaho National Laboratory Water Use Report and Comprehensive Well Inventory, (Revision 25)* is being submitted in accordance with the "*Water Rights Agreement between the State of Idaho and the United States, for the United States Department of Energy"* (Department of Justice 1990), the subsequent Partial Decree for Water Right 34-10901 (District Court 2003) issued June 20, 2003, and the Final Unified Decree (District Court 2014) issued August 26, 2014. As previously agreed (Street 2001), the annual Water Use Report and Comprehensive Well Inventory (CWI) are being combined and submitted as one report.

The Idaho National Laboratory (INL) Site water use reported is for Calendar Year (CY) 2016. Section 2 provides the annual volume of water diverted, maximum and average diversion rates, and "available" pumping levels (water depth) as required by Section 6.2.3 of the Water Rights Agreement for production and potable water wells at the INL Site. Section 2.1 provides total monthly volume, average monthly volume, total annual volume diverted, and water depths (as available) for each production or potable water well. Section 2.2 provides the total monthly volume of water diverted for each facility and the total annual volume for all INL Site production or potable water wells. Section 2.3 provides a summary of the annual water usage, including the total volume of water diverted, maximum diversion rate, and average monthly volume of water diverted for all production and potable wells.

Section 3 is the Comprehensive Well Inventory (CWI) for the INL Site as required by Section 6.2.2 of the Water Rights Agreement. Section 3.1 provides information for new wells. Four new wells were drilled and completed in CY 2016. Section 3.2 provides information for five storm water injection wells decommissioned in CY 2016.

Appendix A provides location maps and diagrams containing detailed construction information for the newly constructed wells.

Appendix B provides location maps and diagrams containing detailed construction and decommissioning information for the decommissioned storm water injection wells.

2. 2016 WATER USE INFORMATION FOR IDAHO NATIONAL LABORATORY SITE

2.1 Water Volume for Individual Idaho National Laboratory Site Production or Potable Water Wells

Eight major facilities are located at the INL Site:

- Advanced Test Reactor Complex (ATR Complex)
- Central Facilities Area (CFA)
- Critical Infrastructure Test Range Complex (CITRC)
- Idaho Nuclear Technology and Engineering Center (INTEC)
- Materials and Fuels Complex (MFC)
- Naval Reactors Facility (NRF)
- Radioactive Waste Management Complex (RWMC)
- Test Area North (TAN).

Each major facility is serviced by one or more production and/or potable water wells. Tables 1 through 8 show the water information for production or potable wells at these facilities.

Seven wells are grouped under the CFA facility. Wells CFA-1 and CFA-2 serve the actual CFA facility. The other five wells (Badging Facility Well, EBR-1, Fire Station Well, Rifle Range Well, and Site-04 [Dairy Farm]) serve smaller facilities or processes. The Fire Station Well has occasionally been used for filling water trucks for construction purposes. However, for 2016, the Fire Station Well was not used because the pump remains inoperable. The Dairy Farm Well is used for irrigating various research projects. The wells identified at other INL Site facilities provide water primarily for that specific facility.

Total monthly volumes are recorded as close to the last day of the month as is reasonably possible. Each table provides the total monthly volume, average monthly volume, and total annual volume of water diverted from each production or potable well during CY 2016. The tables provide water depth as available. Many of the wells were not designed with an access line to measure the water depth. Each well is identified by its official well name, the most common alias name, and the well identification number. Footnotes are provided where applicable.

Section 5.3 of the Water Rights Agreement states: “The use of water for fire suppression benefits the public. Water diverted for fire suppression may be taken randomly, without a definition of the specific elements of a recordable water right, and if so diverted for fire suppression, existing water rights shall not be diminished.” The volumes in the tables may include water used for fire suppression activities. However, there is no way to distinguish water used for fire suppression and water used for other activities.

Table 1. Advanced Test Reactor Complex water volume for 2016.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
TRA-01[a]	NO. 1 DEEP WELL	356	12,934,548	1,600	28,152,000	1,689,000	7,060,000	25,247,000	11,098,000	8,441,000	6,272,000	30,162,000	20,270,000	3,101,000	154,428,148	12,869,012
TRA-03[a]	NO. 3 DEEP WELL	358	435,000	0	0	0	0	0	2,193,000	598,000	10,000	1,911,000	688,000	56,000	5,891,000	490,917
TRA-04	NO. 4 DEEP WELL	359	9,892,000	29,511,000	7,828,000	19,331,000	16,262,000	4,257,000	15,499,000	18,729,000	30,791,000	9,116,000	7,109,000	27,809,000	196,134,000	16,344,500
TRA-1863		1863	3,413,000	3,282,000	3,499,000	3,267,000	3,470,000	3,669,000	4,050,000	3,935,000	3,487,000	3,476,000	3,280,000	3,269,000	42,097,000	3,508,083
Monthly total			26,674,548	32,794,600	39,479,000	24,287,000	26,792,000	33,173,000	32,840,000	31,703,000	40,560,000	44,665,000	31,347,000	34,235,000		
Total annual volume for ATR Complex**: 398,550,148**																
a. Totalizers were out of service in January 2016. Flow is estimated based on recorded operating hours for the pumps.																
Depth to water, static water level: Date — TRA-1863 September 6, 2016 — 471.61 ft bls bls – below land surface																

Table 2. Central Facilities Area water volume for 2016.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
CFA-1	CFA-651	93	544,700	0	756,400	435,700	933,200	1,962,400	3,387,100	0	0	0	274,200	0	8,293,700	691,142
CFA-2	CFA-642	94	560,100	1,098,000	848,100	1,047,800	851,000	5,674,500	6,577,000	13,300,400	8,790,200	2,586,100	1,270,600	935,800	43,539,600	3,628,300
Badging Facility Well	B27-605 Main Gate	88	29,770	29,060	2,190	1,690	1,890	1,530	147,450	188,800	262,580	1,840	1,350	1,070	669,220	55,768
EBR-1		149	434	427	340	1,262	4,920	9,556	11,019	9,225	666	722	351	1,732	40,654	3,388
Rifle Range Well	B21-607 Gun Range	267	1,690	1,890	2,370	1,920	1,850	3,560	1,580	3,450	1,900	2,730	1,400	1,470	25,810	2,151
Site-04	B16-604 Dairy Farm	273	0	0	0	1,720	45,500	0	0	0	0	0	0	0	47,220	3,935
Fire Station Well[a]	Fire Station #2	158														
Monthly total			1,136,694	1,129,377	1,609,400	1,490,092	1,838,360	7,651,546	10,124,149	13,501,875	9,055,346	2,591,392	1,547,901	940,072		
Total annual volume for CFA**: 52,616,204**																
a. Pump for the Fire Station Well is inoperable. Pump has not been repaired or replaced.																

Table 3. Critical Infrastructure Test Range Complex water volume for 2016.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
SPERT-1	PBF Deep Well No. 1	280	273,400	472,100	235,900	268,200	288,800	482,300	721,200	514,900	437,400	303,800	276,200	46,100	4,320,300	360,025
SPERT-2	PBF Deep Well No. 2	281	109,400	5,300	193,500	191,100	375,900	800,500	912,300	534,400	362,700	273,600	208,200	71,000	4,037,900	336,492
Monthly total			382,800	477,400	429,400	459,300	664,700	1,282,800	1,633,500	1,049,300	800,100	577,400	484,400	117,100		
Total annual volume for CITRC: **8,358,200**																

Table 4. Idaho Nuclear Technology and Engineering Center water volume for 2016.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
CPP-01	F-UTI-670	98	9,714,000	14,593,000	9,520,000	10,138,000	9,234,000	8,715,000	8,565,000	4,993,000	6,387,000	6,721,000	19,675,000	18,257,000	126,512,000	10,542,667
CPP-02	F-UTI-671	99	10,558,000	5,454,000	12,689,000	10,025,000	8,784,000	5,890,000	6,827,000	8,378,000	7,308,000	4,849,000	0	0	80,762,000	6,730,167
CPP-04 [a]		101	189,014	166,610	263,986	218,218	210,318	199,310	191,360	221,265	187,248	204,701	189,829	197,467	2,439,326	203,277
ICPP-POT-A-012 [a]	F-UTI-699 or CPP-05	1186	189,014	166,610	263,985	218,219	210,317	199,309	191,361	221,264	187,249	204,702	189,829	197,466	2,439,325	203,277
Monthly total			20,650,028	20,380,220	22,736,971	20,599,437	18,438,635	15,003,619	15,774,721	13,813,529	14,069,497	11,979,403	20,054,658	18,651,933		
Total annual volume for INTEC: **212,152,651**																
a. One flow meter was used for potable wells CPP-04 and ICPP-POT-A-012. Operations switched between the wells weekly, so the totals are estimated to be 50% for each well.																
b. November flow totals are estimated for the time period 11/8 through 11/13 due to a malfunction of the flow meter.																

Table 5. Materials and Fuels Complex water volume for 2016.

			Volume in Gallons													
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
EBR-II #1[a]	EBR-1	150	3,756,500	3,594,500	1,163,000	714,757.5	1,081,743	1,168,230.5	1,049,941.5	1,129,329	593,238	644,348	825,078	1,051,838	16,772,503.5	1,397,709
EBR-II #2[a]	EBR-II	151	3,756,500	3,594,500	1,163,000	714,757.5	1,081,743	1,168,230.5	1,049,941.5	1,129,329	593,238	644,348	825,078	1,051,838	16,772,503.5	1,397,709
Monthly total			7,513,000	7,189,000	2,326,000	1,429,515	2,163,486	2,336,461	2,099,883	2,258,658	1,186,476	1,288,696	1,650,156	2,103,676		
Total annual volume for MFC**: 33,545,007**																
a. The two wells share two flow meters. Operations switch between the wells, so the totals are estimated to be 50% for each well.																

Depth to water, static water level:

Date	EBR-II #1	EBR-II #2
May 2016	660.5 ft bbc	660.5 ft bbc
November 2016	662.3 ft bbc	662.6 ft bbc

bbc – below brass cap

Table 6. Naval Reactors Facility water volume for 2016.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
NRF-1	1	240	1,680,000	1,200,000	12,000	14,000	2,760	0	0	40,000	0	100,000	0	120,000	3,168,760	264,063
NRF-2[a]	2	241	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NRF-3[b]	3	242	65,716	84,407	79,765	59,861	90,917	171,240	63,232	131,214	51,453	64,659	59,918	66,685	989,067	82,422
NRF-4	4	869	1,043,000	720,000	840,000	1,440,000	1,176,000	2,162,000	3,120,000	3,240,000	2,880,000	621,000	1,209,000	1,351,000	19,802,000	1,650,167
NRF-14[b]		2204	244,308	334,509	1,333,820	473,650	387,765	364,253	364,432	451,961	320,195	361,563	340,852	286,213	5,263,521	438,627
Monthly total			3,033,024	2,338,916	2,265,585	1,987,511	1,657,442	2,697,493	3,547,664	3,863,175	3,251,648	1,147,222	1,609,770	1,823,898		
Total annual volume for NRF: **29,223,348**																
a. NRF-2 was removed from service in 2006. Future use will be determined. b. Wells NRF-3 and NRF-14 are used as potable water wells.																
Depth to water, static water level: Date — NRF-3 — NRF-14 May 2016 — 389.78 ft bls — 389.26 ft bls November 2016 — 390.55 ft bls — 390.01 ft bls bls – below land surface																

Table 7. Radioactive Waste Management Complex water volume for 2016.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
RWMC Production		268	351,200	414,200	410,600	288,700	394,100	823,600	1,242,600	1,135,300	649,300	218,900	272,400	213,100	6,414,000	534,500
PIT 9 Production Well		2155	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly total			351,200	414,200	410,600	288,700	394,100	823,600	1,242,600	1,135,300	649,300	218,900	272,400	213,100		
Total annual volume for RWMC: **6,414,000**																

Table 8. Test Area North water volume for 2016.

Volume in Gallons																
Well	Alias	INL Well ID	January	February	March	April	May	June	July	August	September	October	November	December	Total Annual Volume	Average Monthly Volume
ANP-01[a]	TAN-612	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ANP-02	TAN-613	70	64,500	132,000	113,100	95,900	156,900	239,800	182,900	382,800	174,100	200,600	138,200	124,000	2,004,800	167,067
FET-1	TAN-632	154	302,500	107,500	82,700	157,300	527,300	740,400	846,800	630,200	263,400	237,700	0	0	3,895,800	324,650
FET-2	TAN-639	155	0	335,800	295,900	205,600	0	0	4,700	381,600	320,000	547,800	544,700	446,200	3,082,300	256,858
Monthly total			367,000	575,300	491,700	458,800	684,200	980,200	1,034,400	1,394,600	757,500	986,100	682,900	570,200		
Total annual volume for TAN: **8,982,900**																
a. Well is maintained as a backup well for ANP-02.																

2.2 Combined Total Volume Diverted from All Production and Potable Water Wells

Table 9 provides the combined total volume from all production and potable water wells at the INL Site during CY 2016. Table 9 includes:

- Total monthly volume of water diverted for each major INL Site facility
- Combined total monthly volume diverted from all the major INL Site facilities
- Monthly average volume diverted for all wells combined
- Monthly maximum volume diverted for all wells combined
- Total annual volume diverted at the INL Site.

Table 9. Idaho National Laboratory Site water volume totals for 2016.

Volume in Gallons												
Facility	January	February	March	April	May	June	July	August	September	October	November	December
Advanced Test Reactor Complex	26,674,548	32,794,600	39,479,000	24,287,000	26,792,000	33,173,000	32,840,000	31,703,000	40,560,000	44,665,000	31,347,000	34,235,000
Central Facilities Area	1,136,694	1,129,377	1,609,400	1,490,092	1,838,360	7,651,546	10,124,149	13,501,875	9,055,346	2,591,392	1,547,901	940,072
Critical Infrastructure Test Range Complex	382,800	477,400	429,400	459,300	664,700	1,282,800	1,633,500	1,049,300	800,100	577,400	484,400	117,100
Idaho Nuclear Technology and Engineering Center	20,650,028	20,380,220	22,736,971	20,599,437	18,438,635	15,003,619	15,774,721	13,813,529	14,069,497	11,979,403	20,054,658	18,651,933
Materials and Fuels Complex	7,513,000	7,189,000	2,326,000	1,429,515	2,163,486	2,336,461	2,099,883	2,258,658	1,186,476	1,288,696	1,650,156	2,103,676
Naval Reactors Facility	3,033,024	2,338,916	2,265,585	1,987,511	1,657,442	2,697,493	3,547,664	3,863,175	3,251,648	1,147,222	1,609,770	1,823,898
Radioactive Waste Management Complex	351,200	414,200	410,600	288,700	394,100	823,600	1,242,600	1,135,300	649,300	218,900	272,400	213,100
Test Area North	367,000	575,300	491,700	458,800	684,200	980,200	1,034,400	1,394,600	757,500	986,100	682,900	570,200
Monthly Totals	**60,108,294**	**65,299,013**	**69,748,656**	**51,000,355**	**52,632,923**	**63,948,719**	**68,296,917**	**68,719,437**	**70,329,867**	**63,454,113**	**57,649,185**	**58,654,979**
Maximum monthly volume (gallons)	70,329,867 for September 2016											
Total average monthly volume (gallons)	62,486,871											
Annual total for 2016 (gallons)	**749,842,458**											

2.3 Water Use Summary

The INL Site's Federal Reserved Water Right is 35,000 acre-ft/yr (1.14×10^{10} gal/yr) and not to exceed a maximum diversion rate of 80 ft^3/s (35,906 gpm). The total volume of water diverted at the INL Site for CY 2016 was approximately 7.50×10^8 gal (see Table 9) or approximately 6.58% of the annual water right. The maximum monthly volume of water diverted was 70,329,867 gal and the maximum diversion rate was 3.63 ft^3/s that occurred in September. The average monthly volume of water diverted for all INL Site production and potable wells was approximately 6.25×10^7 gal. The INL Site's water use remained well within the established water right.

3. COMPREHENSIVE WELL INVENTORY, REVISION 25

3.1 Idaho National Laboratory Site New and Modified Wells in Calendar Year 2016

Four new wells, USGS-142, USGS-142A, USGS-143 and USGS-144 were constructed at the INL Site in CY 2016 and are listed in Table 10. These wells were drilled by the USGS to improve the understanding of hydrogeology in different areas on the INL Site. Maps and detailed construction diagrams can be found in Appendix A.

USGS-142 and USGS-142A were placed in the west-central area of the INL. USGS-142 was cored from land surface to approximately 1880 ft bls. The core will be sampled to provide additional data for the interpretation of the geologic evolution of the eastern Snake River Plain (ESRP), base of the ESRP aquifer, and also provide stratigraphic information to improve the understanding of groundwater flow model inputs at the INL. Originally this well was intended to be a dual piezometer well with deep and shallow screened zones. Because of problems during construction it was decided to complete the well with a single screen piezometer line. The well is equipped with a 1.5-in. PVC pipe and slotted well screen that extends from 810 to 840 ft bls. The 1.5-in. pipe is used by the USGS to collect water level data.

Well USGS-142A was drilled near USGS-142 to a depth of 560 ft bls and completed to a depth of 547 ft bls. This well was drilled to collect water level data within the upper ESRP aquifer. Well USGS-142A is equipped with a 1-in. steel pipe that was slotted between 526 to 546 ft bls. Data collected from USGS-142 and USGS-142A will be used to improve INL groundwater models for this region of the ESRP aquifer through routine collection of water level data.

Well USGS-143 was placed northeast of the MFC. The well was cored to approximately 829 ft bls and paleomagnetic analysis will be run and used for interpretation of related stratigraphy. On completion of core drilling, well USGS-143 was constructed as a monitoring well that is open (not screened) between 490 to 801 ft bls. Well USGS-143 is equipped with a 1-in. stainless steel water level access line down to 730 ft bls. The initial water level was measured at 725 ft bls. A 5 horsepower pump is set in the well with an inlet depth of 744 ft bls. The pump discharge line consists of 1.25-in. stainless steel pipe, set approximately 2 ft above land surface. Groundwater and geologic data collected will be used to improve INL groundwater and stratigraphic framework models.

Well USGS-144 was placed southwest of CFA. In addition to improving the understanding of hydrogeology in this area, the well will also serve to fill a data gap outlined in the INL groundwater monitoring plan (DOE 2012). The well was cored to approximately 638 ft bls and paleomagnetic analysis will be run and used for interpretation of related stratigraphy. On completion of core drilling, well USGS-144 was constructed as a monitoring well. The well is open (not screened) between 502 to 620 ft bls. The well is equipped with a 1-in. stainless steel water level access line down to 560 ft bls. The initial water level was measured at 522 ft bls. A 5 horsepower pump is set in the well with an inlet depth of 600 ft bls. The pump discharge line consists of 1.25-in. stainless steel pipe, set approximately 2 ft above land surface. Groundwater and geologic data collected will be used to improve INL groundwater and stratigraphic framework models.

The CWI database maintains detailed well information that can be provided electronically to the State upon request.

Table 10. Idaho National Laboratory Site new wells constructed in Calendar Year 2016.

Well Name	Type	Borehole Depth (ft bls)	Casing Diameter	Construction Material	Status	Location	Driller/ License #
USGS-142	Monitoring	1880	6 inch from -1 to 506 ft 1.5 inch from -2 to 846 ft (Screened from 810 to 840 ft)	Carbon Steel PVC	Active	T04N, R29E, Sec. 29, NW ¼, NE ¼, SE ¼	USGS
USGS-142A	Monitoring	560	8 inch from -2 to 40 ft 1 inch from -2 to 546 ft (Screened from 526 to 546 ft)	Carbon Steel PVC	Active	T04N, R29E, Sec. 29, NW ¼, NE ¼, SE ¼	USGS
USGS-143	Monitoring	829	10 inch from -1 to 10 ft 6 inch from -2 to 490 ft	Carbon Steel Carbon Steel	Active	T03N, R33E, Sec. 03, NE ¼, NE ¼, NW ¼	USGS
USGS-144	Monitoring	638	8 inch from 39 to 137 ft 6 inch from -1 to 502 ft	Carbon Steel Carbon Steel	Active	T02N, R30E, Sec. 18, NW ¼, NW ¼, NE ¼	USGS

3.2 Idaho National Laboratory Site Wells Decommissioned in Calendar Year 2016

Five IDWR permitted deep storm water injection wells (Table 11) were evaluated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for inclusion as potential new sites. It was determined there was no evidence of release of hazardous substances or radiological contamination into these wells. The five wells, SPERT DISP 1, SPERT DISP 3, TAN DRAINAGE DISP. 01, TAN DRAINAGE DISP. 02, and TAN DRAINAGE DISP. 03 were decommissioned in accordance with IDWR injection well requirements (IDAPA 37.03.03) in CY 2016. The five wells were no longer being used for their intended purpose of storm water injection. The last documented storm water discharge to these wells was in 1999.

Once the decision was made to decommission the wells, "Authorization to Decommission a Well" forms and decommissioning plan was submitted to IDWR (Miller 2016) on August 9, 2016. The IDWR approved the decommissioning on August 25, 2016 (Fischer 2016).

For SPERT DISP 1, SPERT DISP 3, TAN DRAINAGE DISP. 01, and TAN DRAINAGE DISP. 03, each well casing terminated inside a concrete vault. In addition, each well had an associated settling basin where storm water was collected before entering the injection well. Water from the settling basin entered the concrete vault through a pipe.

Decommissioning of these four injection wells consisted of cutting the well casings off at the bottom of the concrete vaults. Each well casing and annular space was filled with neat cement grout containing 5% bentonite (Figure 3-1). The grout was allowed to cure. After curing, the vaults were filled with neat cement grout to within 6 inches from the top of the concrete vaults. This effectively sealed the wells and inlet pipes. The grout inside the vaults was allowed to cure and approximately 6 inches of native fill material was placed to the top of the vault (Figure 3-2).

Table 11. Idaho National Laboratory Site storm water injection wells reported as decommissioned in Calendar Year 2016.

Well Name	Well ID	Type	Method and Date Decommissioned
SPERT DISP 1	282	Deep Storm Water Injection	Well casing, annular space and concrete vault filled with neat cement grout containing 5% bentonite. Started 10/20/2016. Completed on 11/22/2016.
SPERT DISP 3	284	Deep Storm Water Injection	Well casing, annular space and concrete vault filled with neat cement grout containing 5% bentonite. Started 10/20/2016. Completed on 11/22/2016.
TAN DRAINAGE DISP. 01	338	Deep Storm Water Injection	Well casing, annular space and concrete vault filled with neat cement grout containing 5% bentonite. Started 11/15/2016. Completed on 11/22/2016.
TAN DRAINAGE DISP. 02	339	Deep Storm Water Injection	Vault filled with neat cement grout containing 5% bentonite. Started on 11/15/2016. Completed on 11/17/2016
TAN DRAINAGE DISP. 03	340	Deep Storm Water Injection	Well casing, annular space and concrete vault filled with neat cement grout containing 5% bentonite. Started 11/15/2016. Completed on 11/17/2016.

Figure 3-1. Cement grout being poured into well TAN DRAINAGE DISP. 01.

Figure 3-2. Native fill being placed and compacted on top of cured cement grout at well TAN DRAINAGE DISP. 03.

The fifth well, TAN DRAINAGE DISP. 02 (Table 11), was originally constructed similar to the other four injection wells. However, in 1999 under CERCLA, the casing was extended above ground to allow for the well to be used for CERCLA monitoring purposes. A section of the casing was screened to still allow the discharge of storm water into the well. The approved decommissioning method (Fischer 2016) for this injection well was to fill the vault with neat cement grout to within 6 inches of the top of the vault. Native fill was then placed on top of the grout to the top of the vault. This effectively sealed the storm

water inlet screen preventing storm water from entering the injection well. The well casing extends above land surface as shown in Figure 3-3. See Figure B-7 for detailed construction information.

Figure 3-3. Surface view of Well TAN DRAINAGE DISP. 02 after storm water injection portion of the well was decommissioned.

On December 12, 2016, the completed, signed, and certified “Abandonment Report” forms were submitted to the IDWR Underground Injection Control Program for the 5 storm water injection wells (Mascareñas 2016).

The CWI database maintains detailed well information that can be provided electronically to the state upon request.

4. REFERENCES

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DOE/ID-11034, Idaho National Laboratory Groundwater Monitoring and Contingency Plan Update, May 2012.

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Appendix A

Maps and Construction Diagrams for New Wells Completed in CY2016

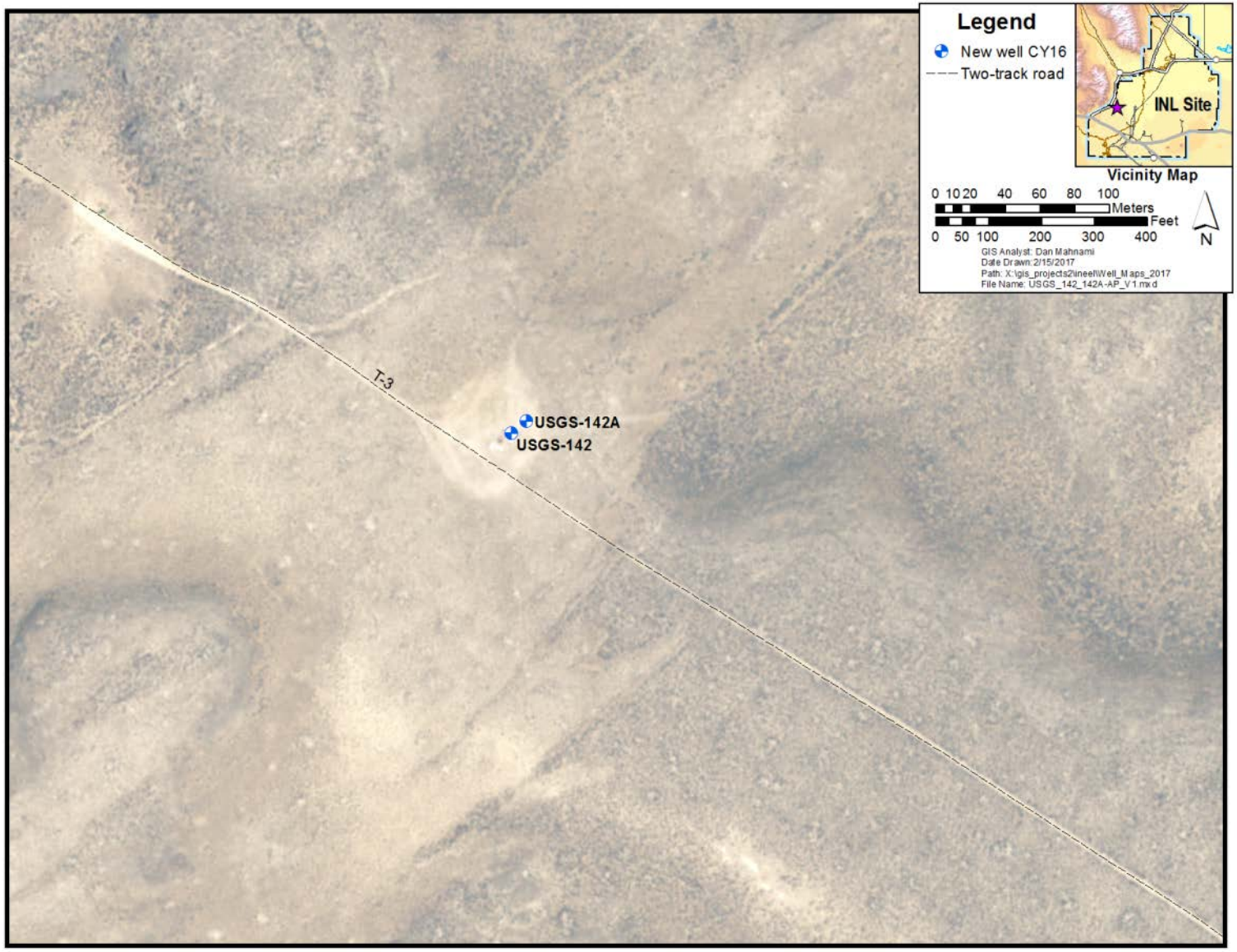
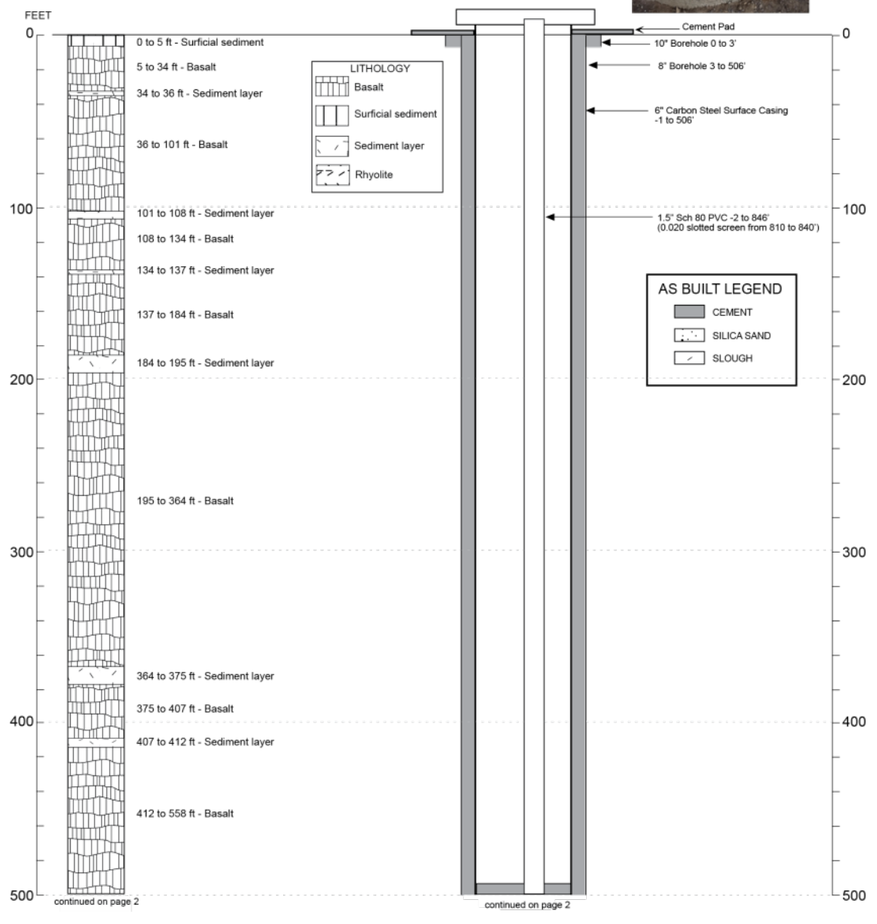


Figure A-1. Map showing location of new wells USGS-142 and USGS-142A.

WELL NAME: **USGS-142**
WELL ID: 2249
Facility: INL
Well Type: Monitoring
Well Status: Active
Year Drilled: 2016
Total Depth: 1880 ft bls
Drilling Start Date 7/08/2014 Drilling End Date 8/11/2016
Completion Depth: 846 ft bls

Driller: USGS
Geologist: M Hodges
Drill Method: Air/Mist Rotary/core
Drill Fluid: Air/Water
Land Surface: 4991.81 (29) B.C.
4995.31 (88) B.C.
Water Level:
Water Level/ Date:
Water Level Access:



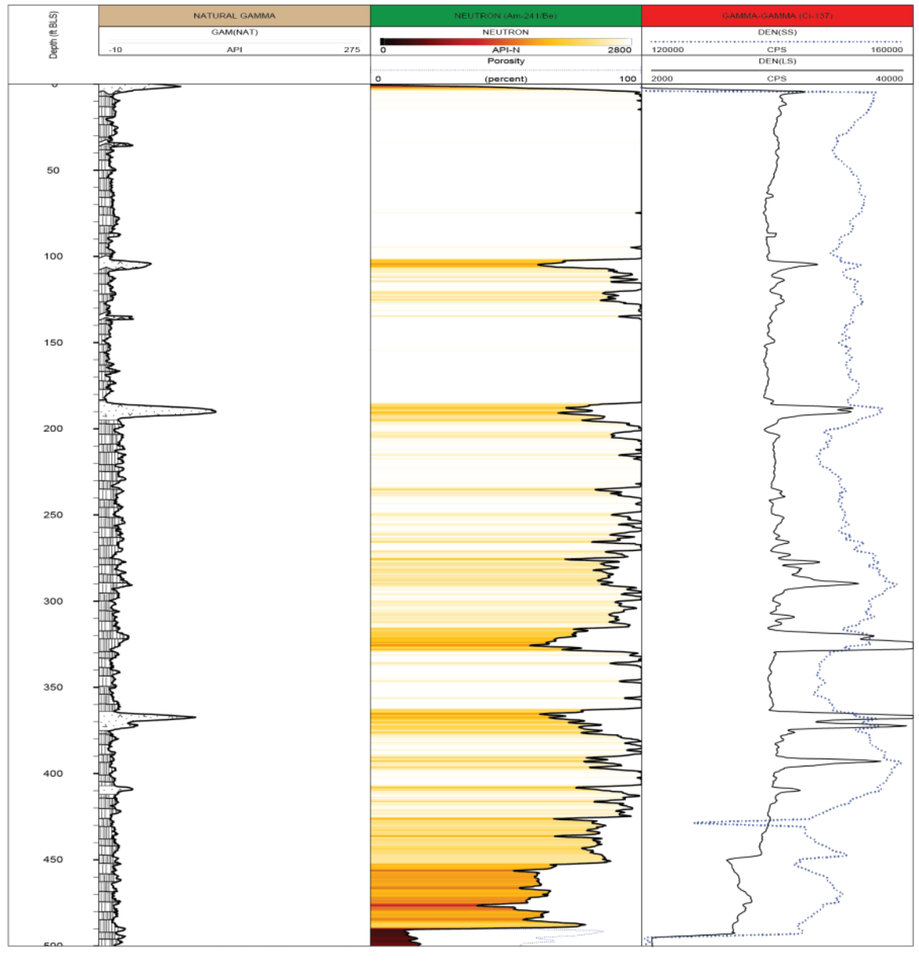
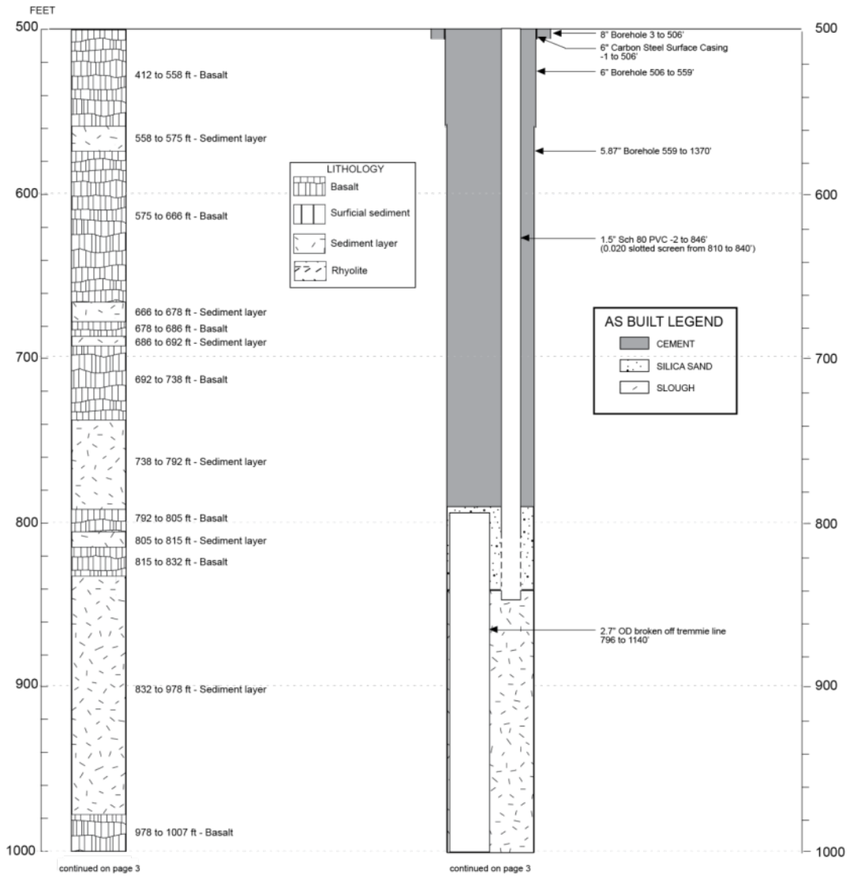


Figure A-2. Construction diagram for new well USGS-142.

WELL NAME: **USGS-142**



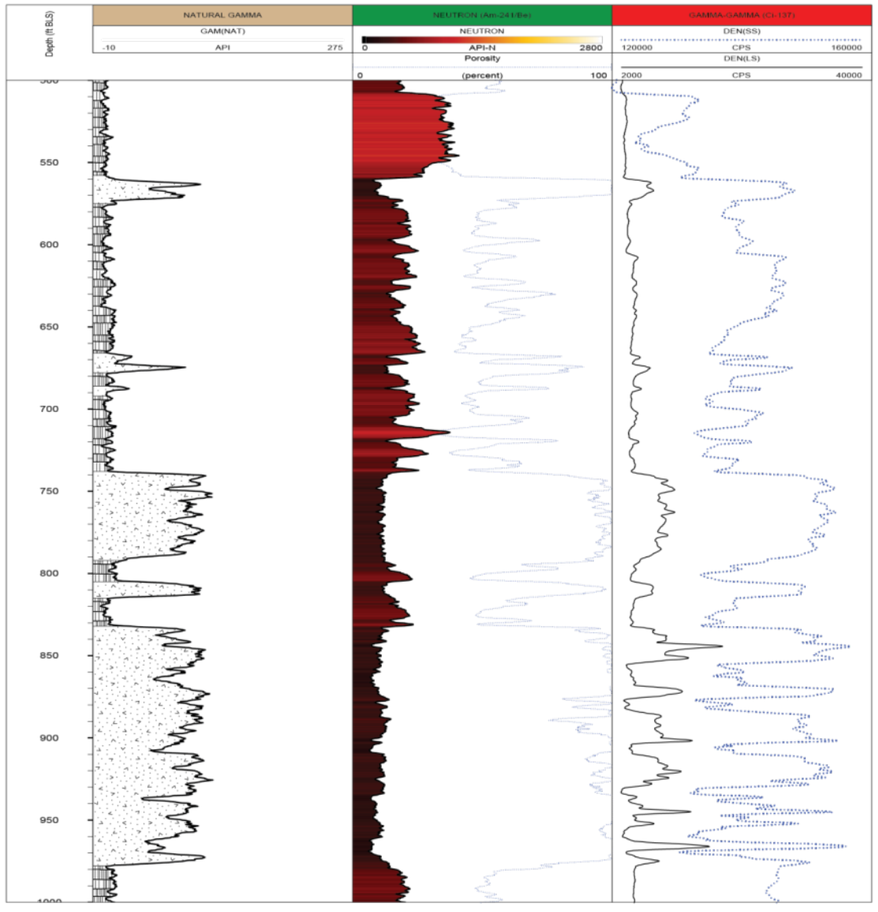
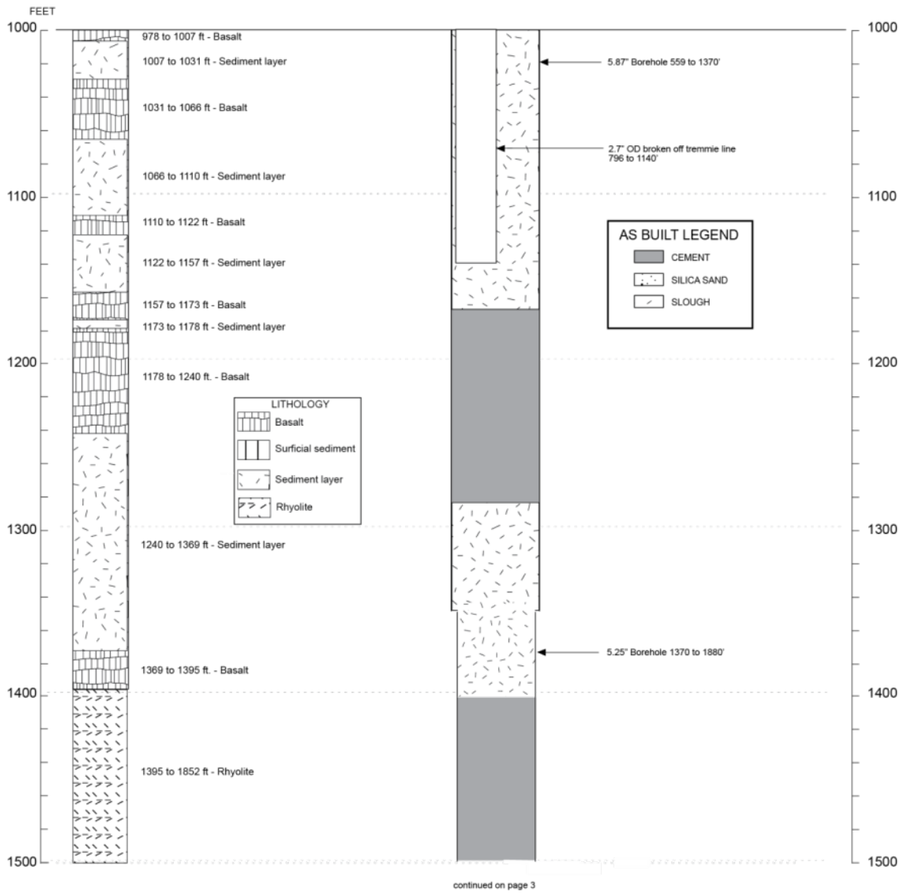


Figure A-2 continued.

WELL NAME: **USGS-142**



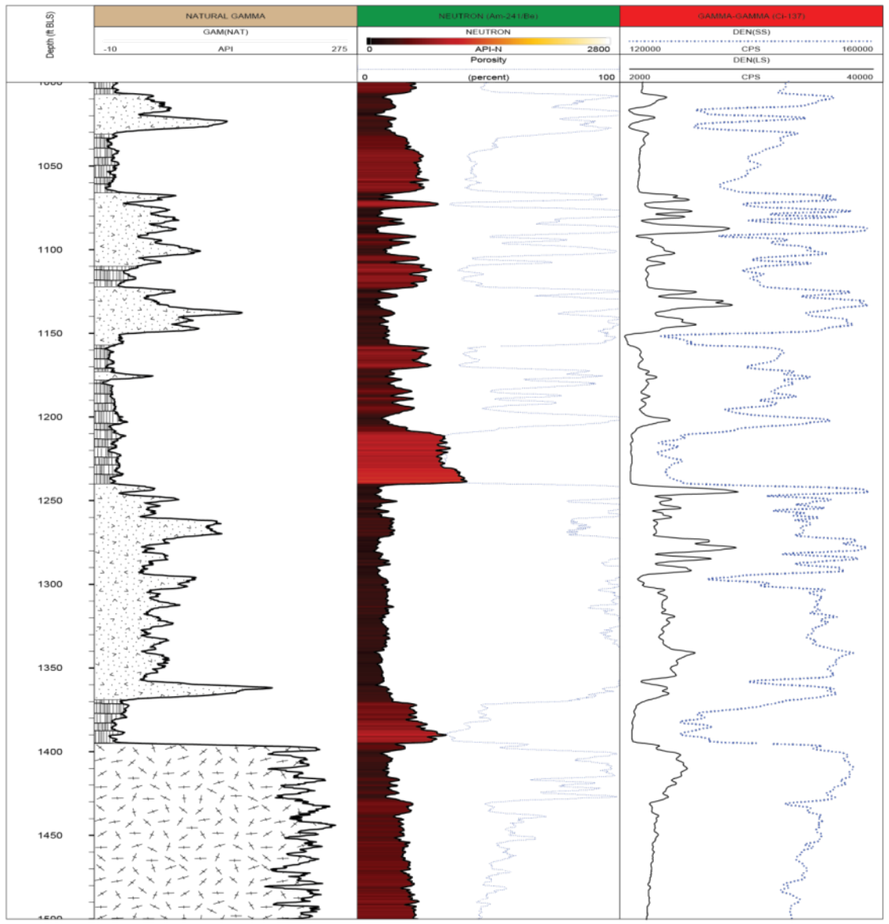
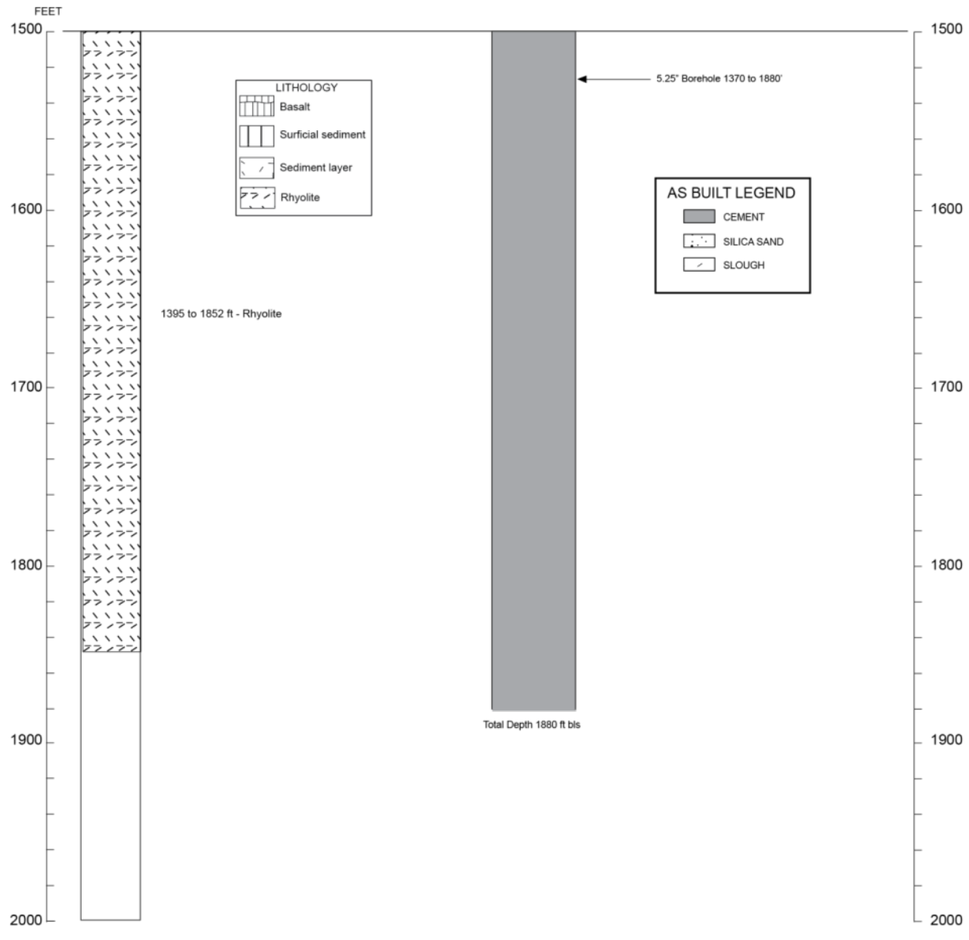


Figure A-2 continued.

WELL NAME: **USGS-142**



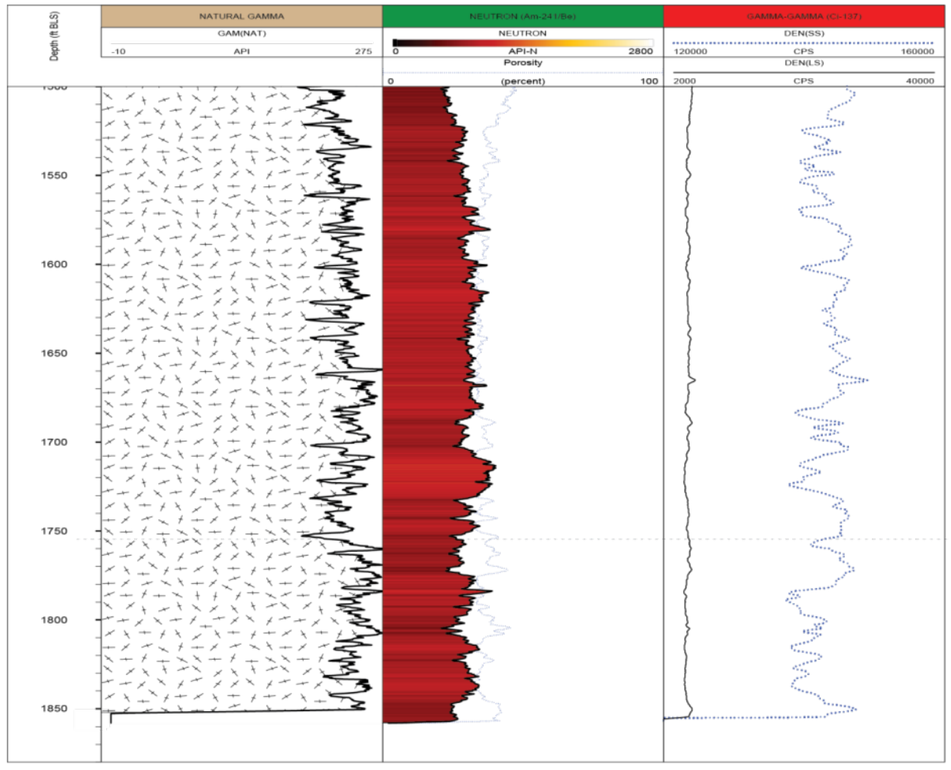
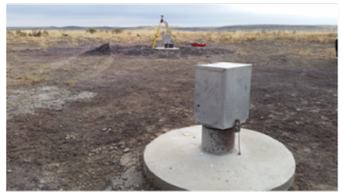
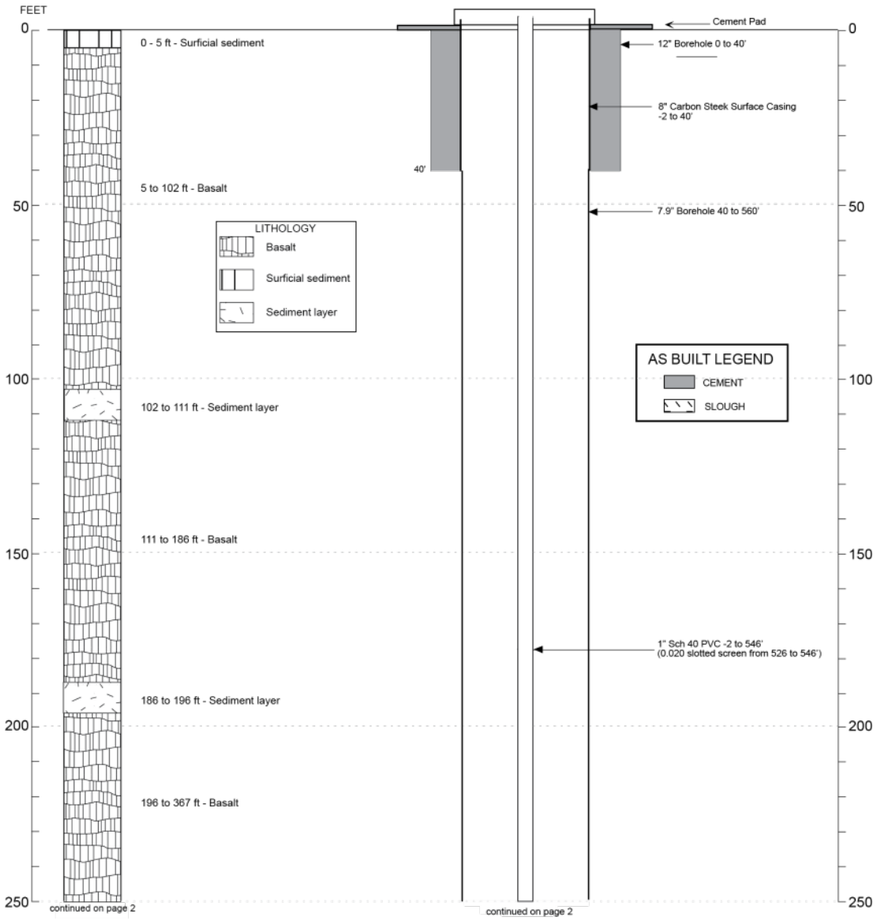


Figure A-2 continued.

WELL NAME: **USGS-142A**
WELL ID: 2300
Facility: INL
Well Type: Monitoring
Well Status Active
Year Drilled: 2016
Total Depth 560 ft bls
Drilling Start Date 7/27/2016 Drilling End Date 8/11/2016
Completion Depth: 547 ft bls

Driller: USGS
Geologist: M Hodges
Drill Method: Air/Mist Rotary/core
Drill Fluid: Air/Water
Land Surface: 4991.75 (29) B.C.
4995.25 (88) B.C.
Water Level: 530.7 ft bls
Water Level/ Date: 8/9/2016
Water Level Access: Hole





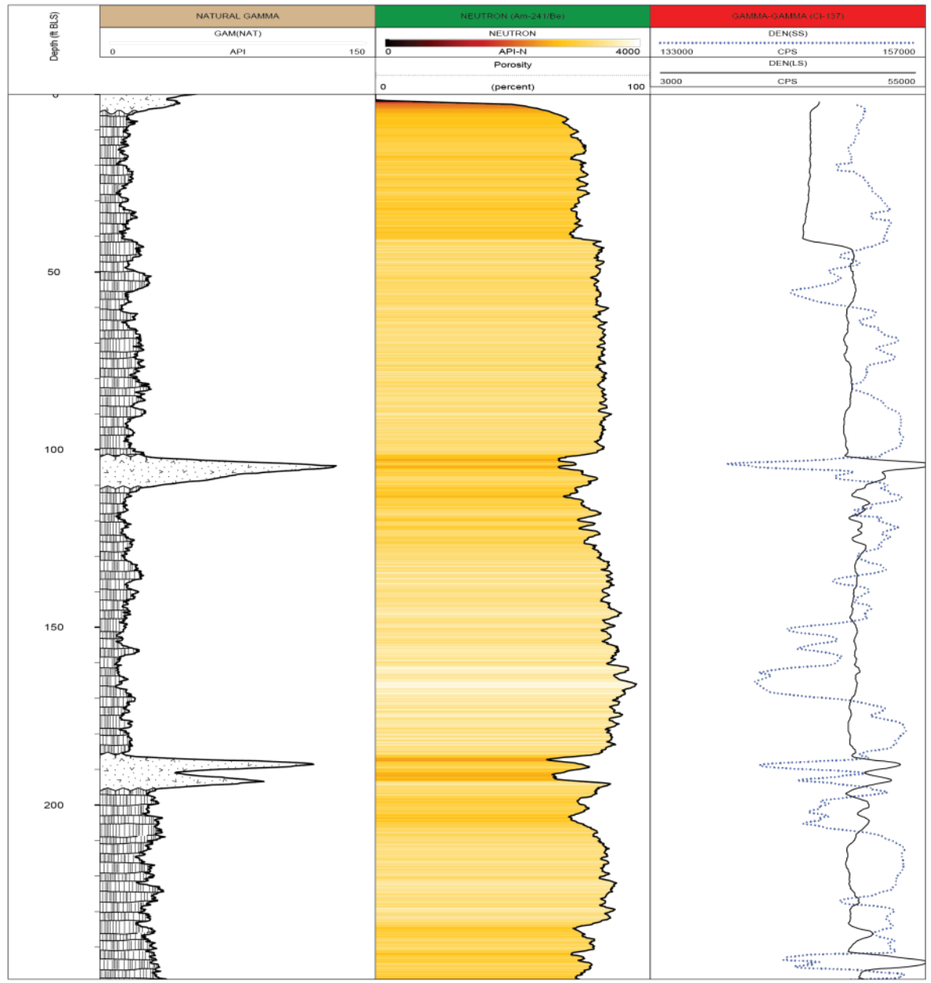
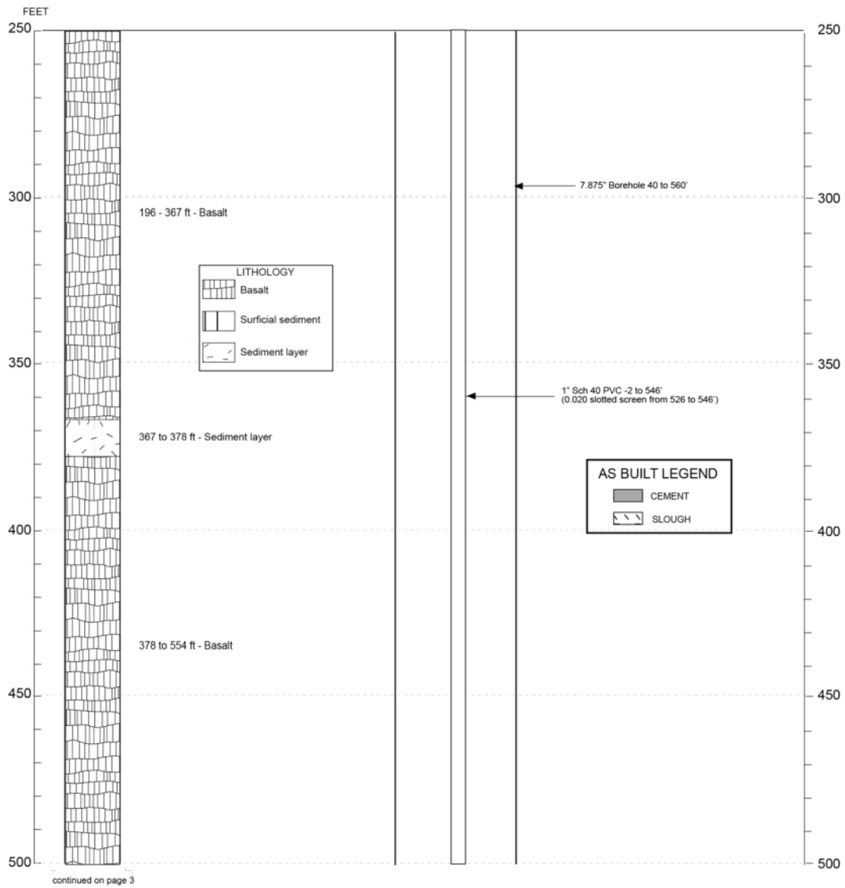


Figure A-3. Construction diagram for new well USGS-142A.

WELL NAME: **USGS-142A**



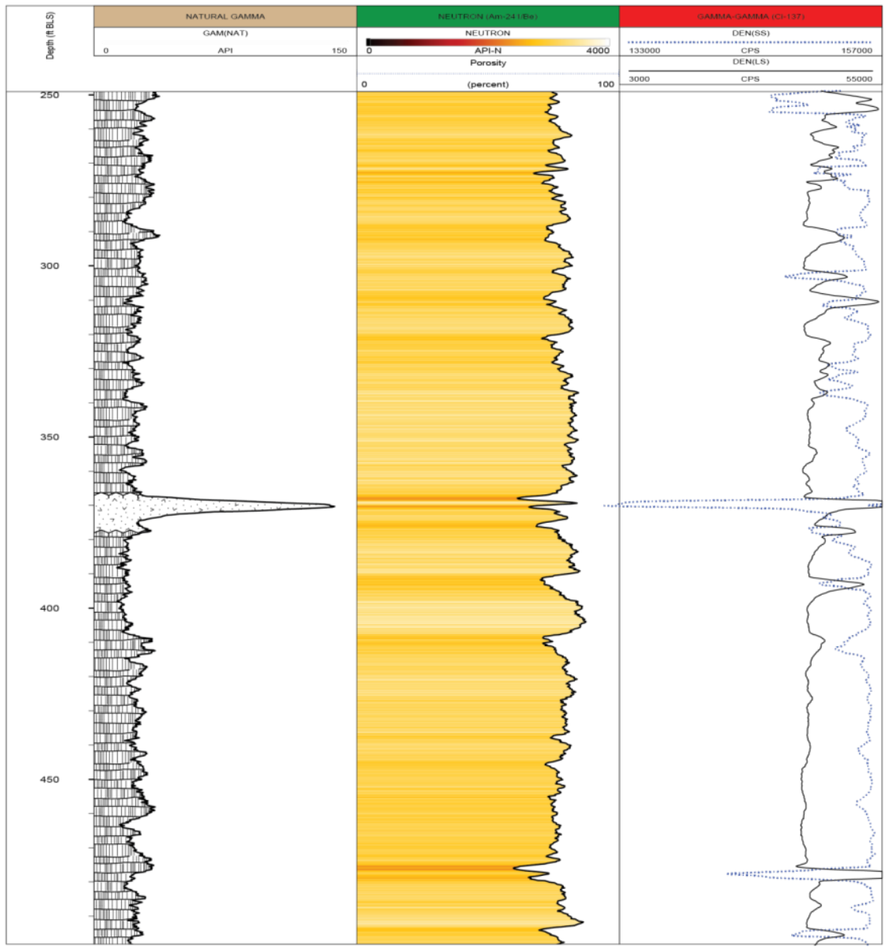
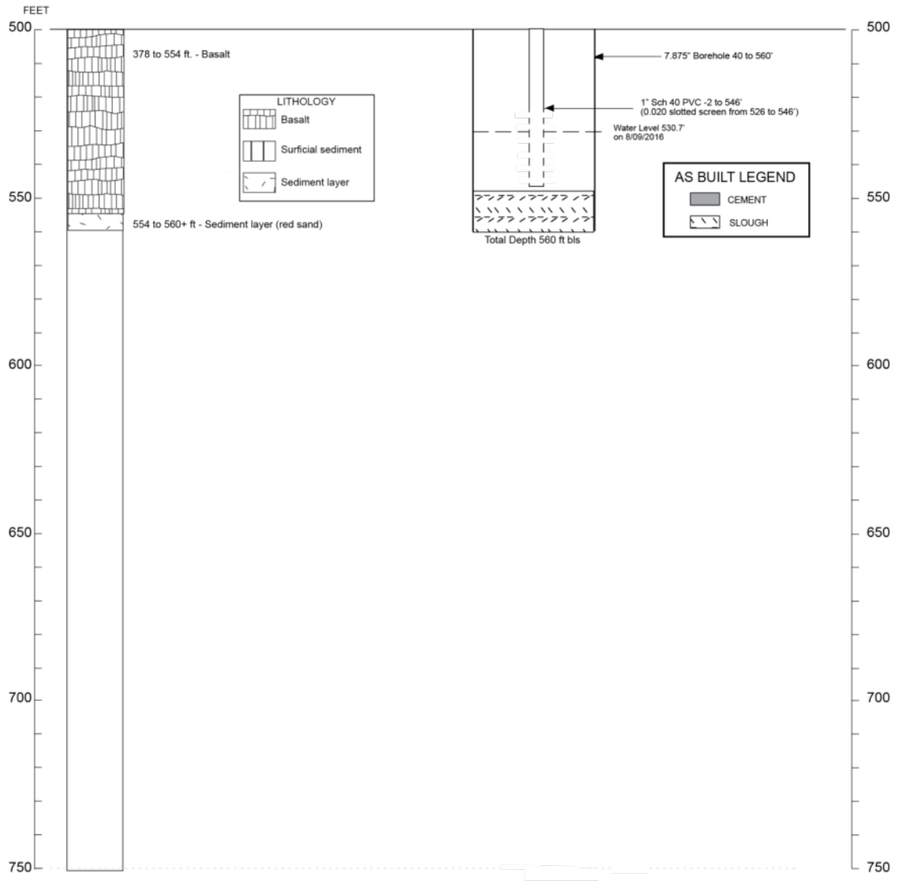
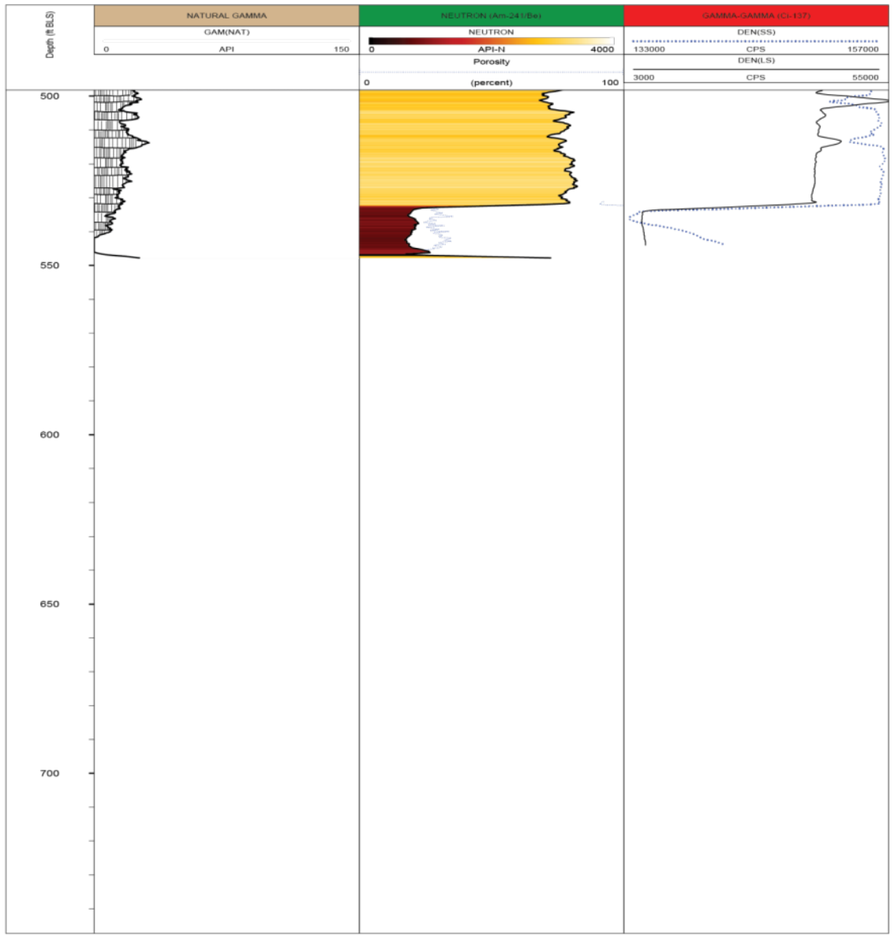


Figure A-3. continued.

WELL NAME: **USGS-142A**





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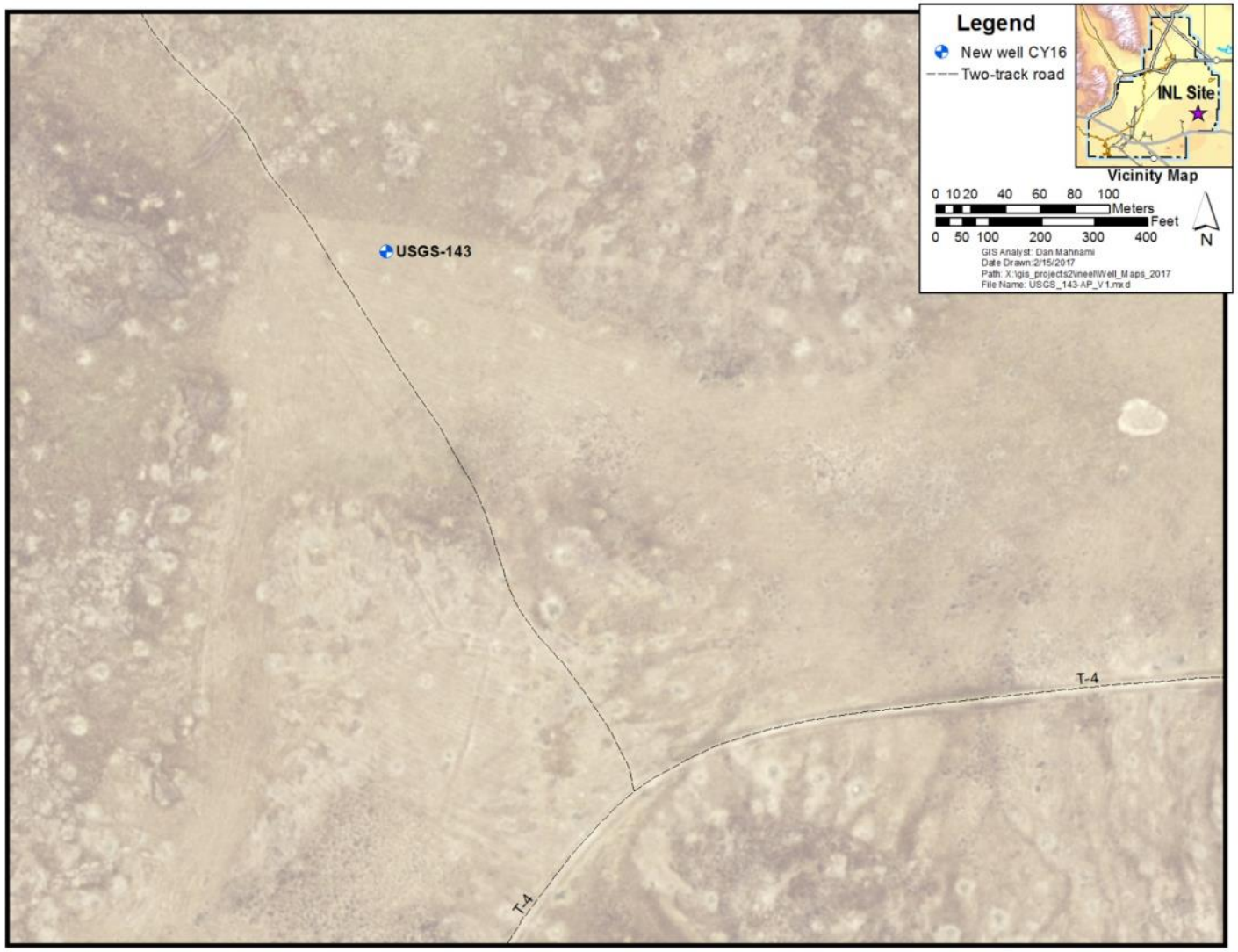
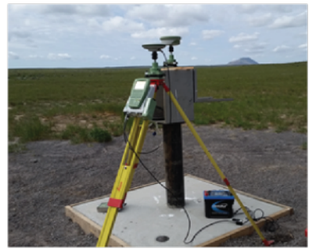
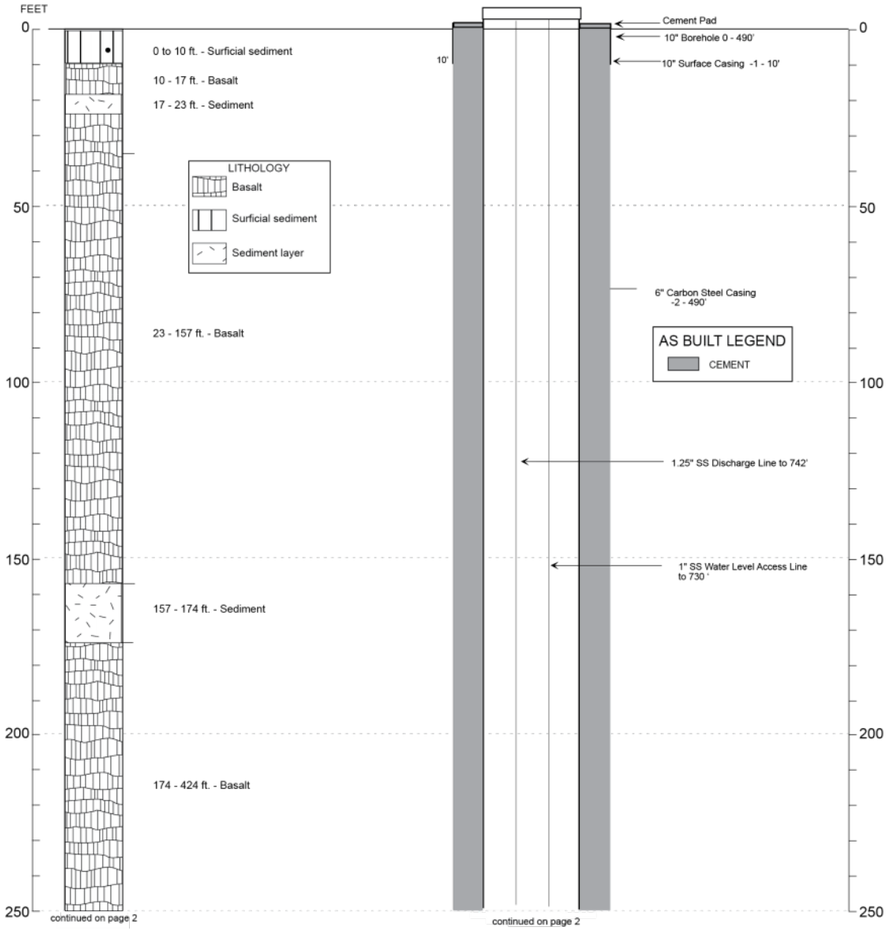


Figure A-4. Map showing location of new well USGS-143.

WELL NAME: **USGS-143**
WELL ID: **2250**
Facility: INL (near MFC)
Well Type: Monitoring
Well Status Active
Year Drilled: 2015-2016
Total Depth 829'
Drilling Start Date 10/01/2015 Drilling End Date 5/23/2016
Completion Depth: 801'

Driller: USGS
Geologist: M Hodges
Drill Method: Air/Mist Rotary/core
Drill Fluid: Air/Water
Land Surface: 5184.35 (29) B.C.
5187.95 (88) B.C.
Water Level: 725 ft bls
Water Level/ Date: 11/12/2015
Water Level Access: Hole





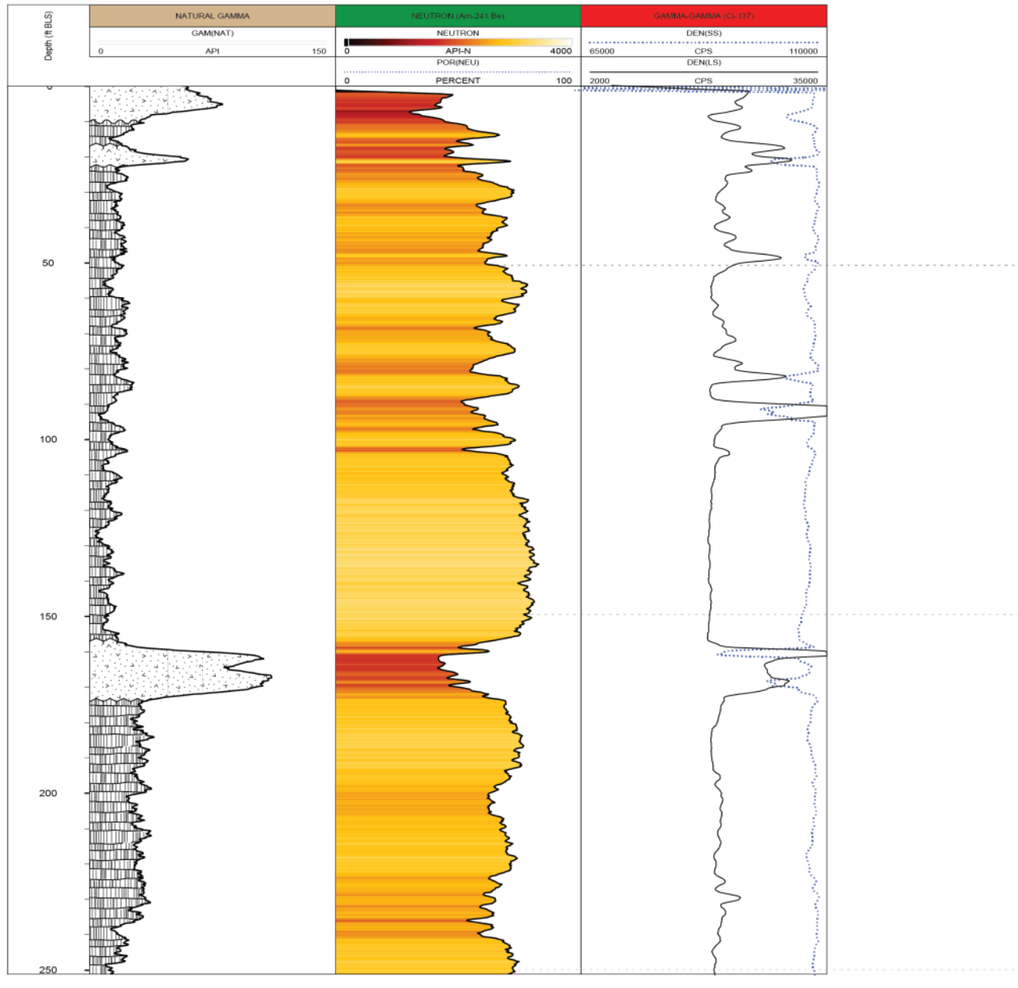
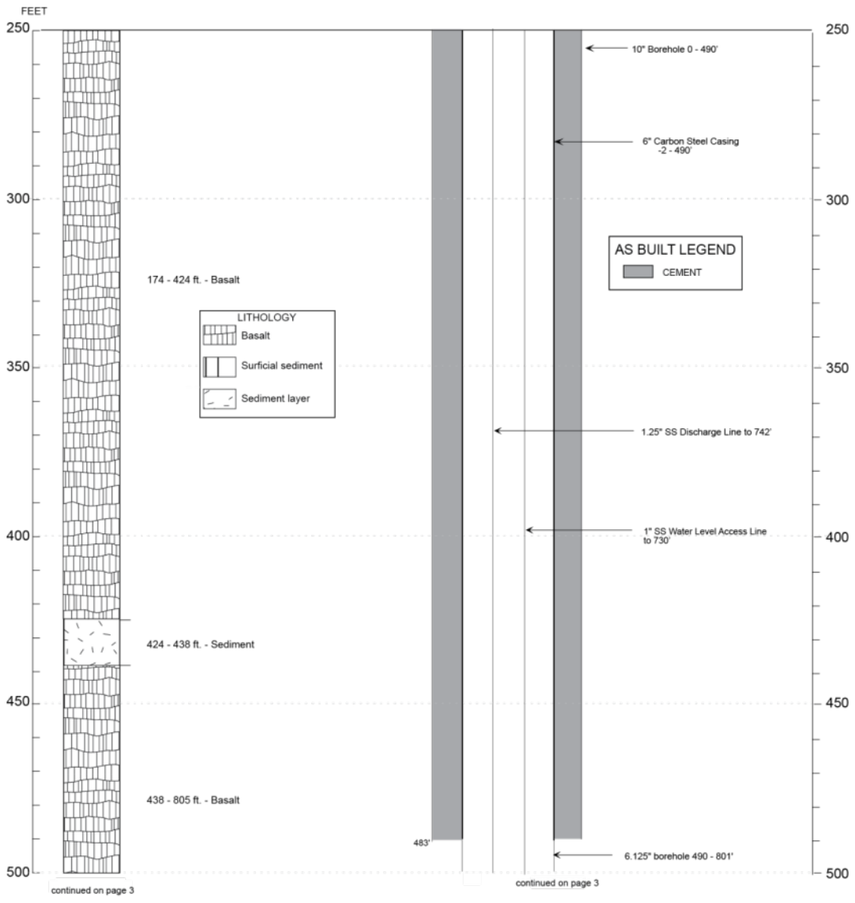
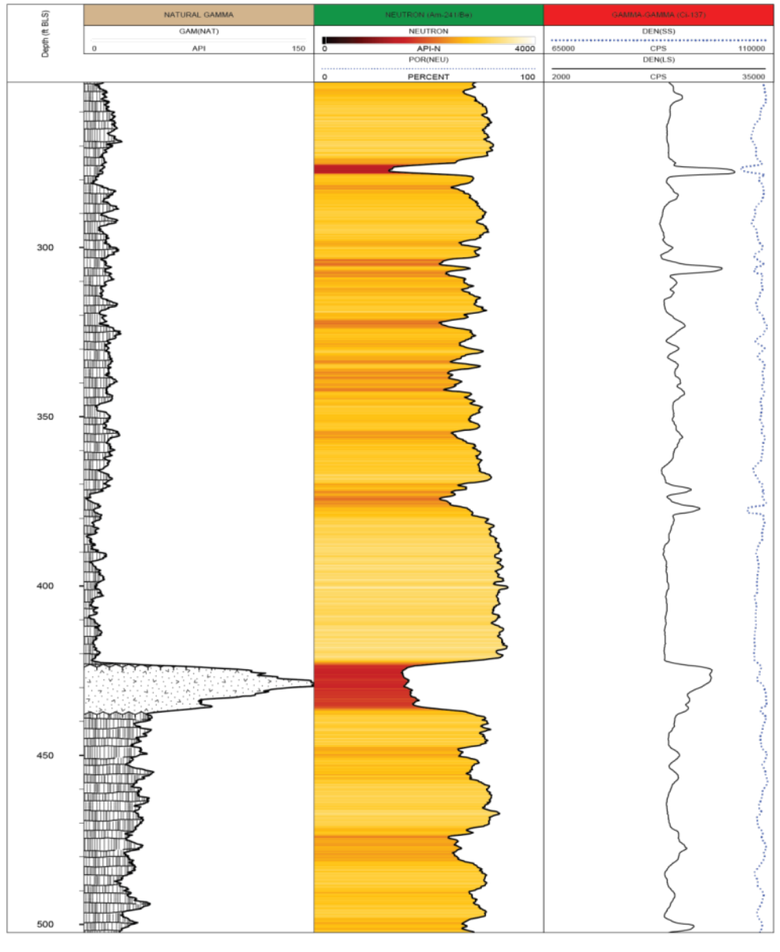


Figure A-5. Construction diagram for new well USGS-143.

WELL NAME: **USGS-143**





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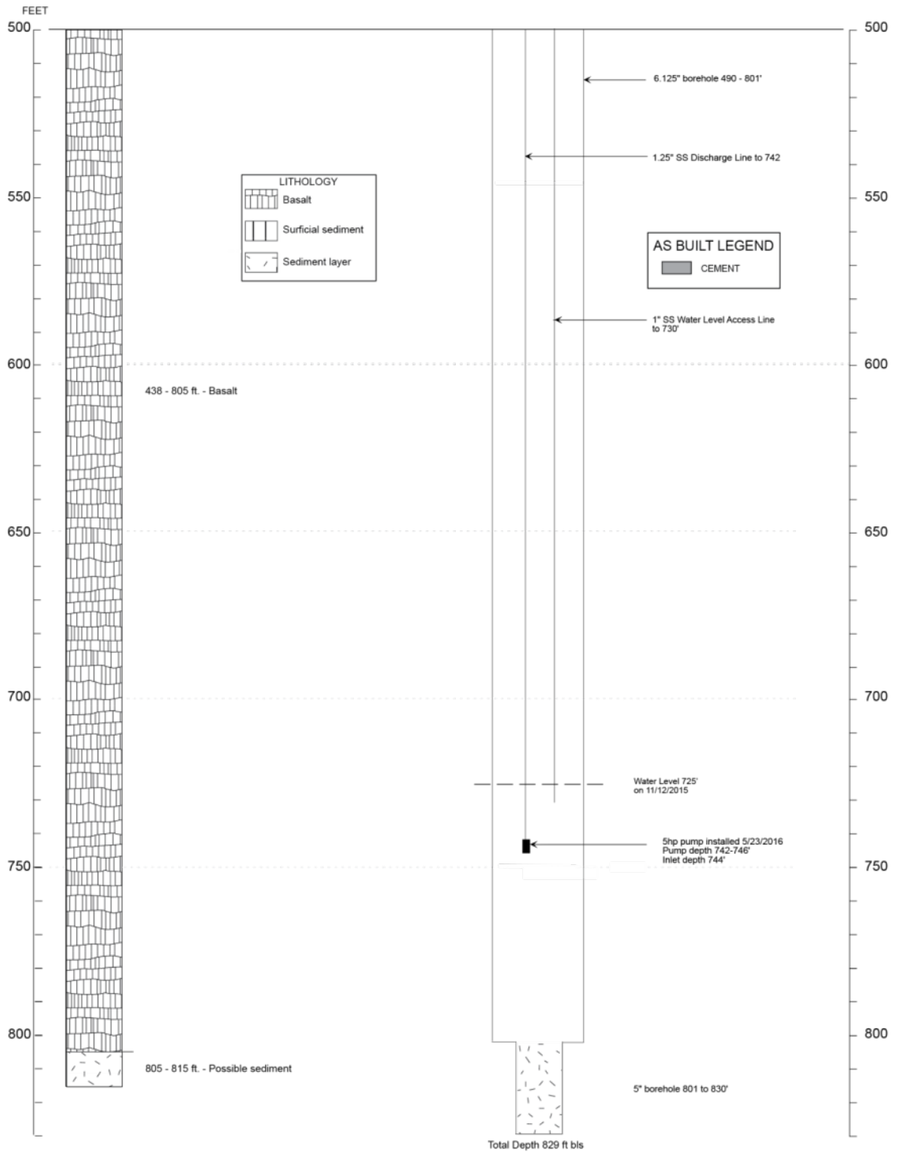

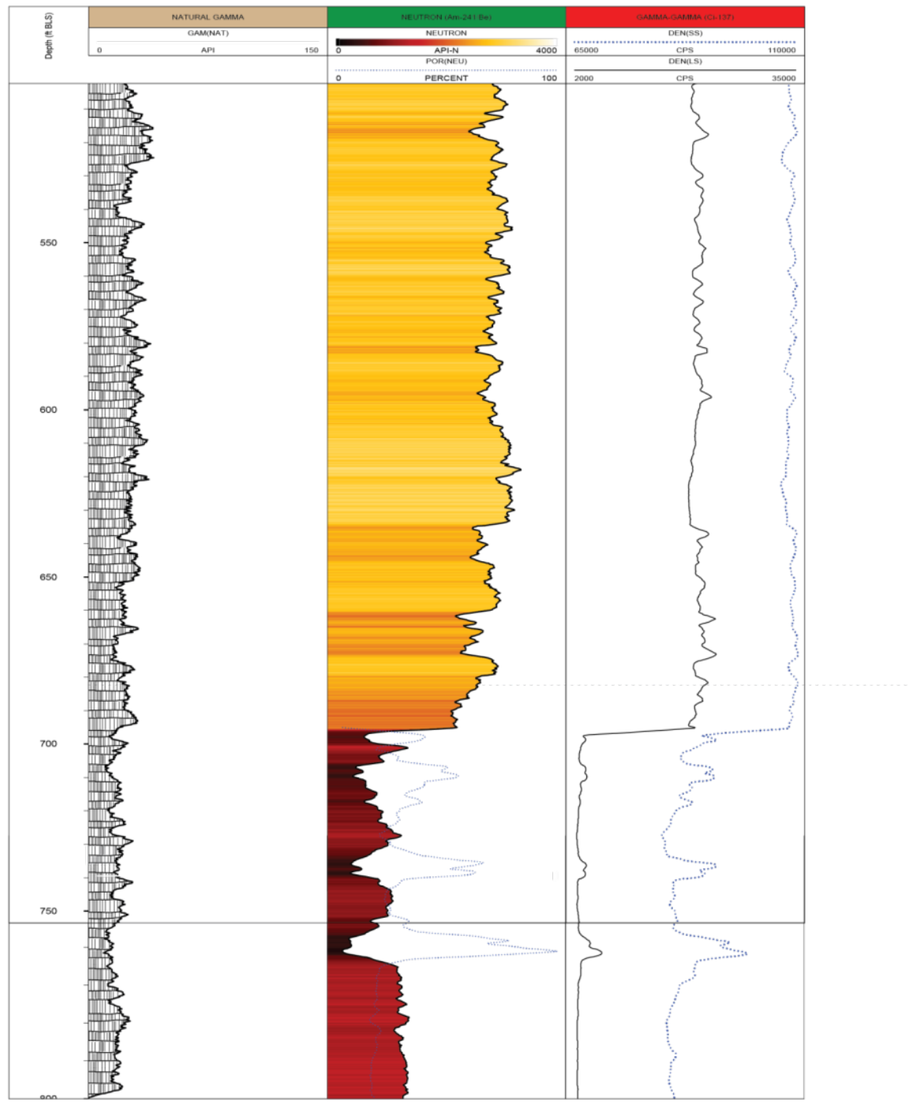

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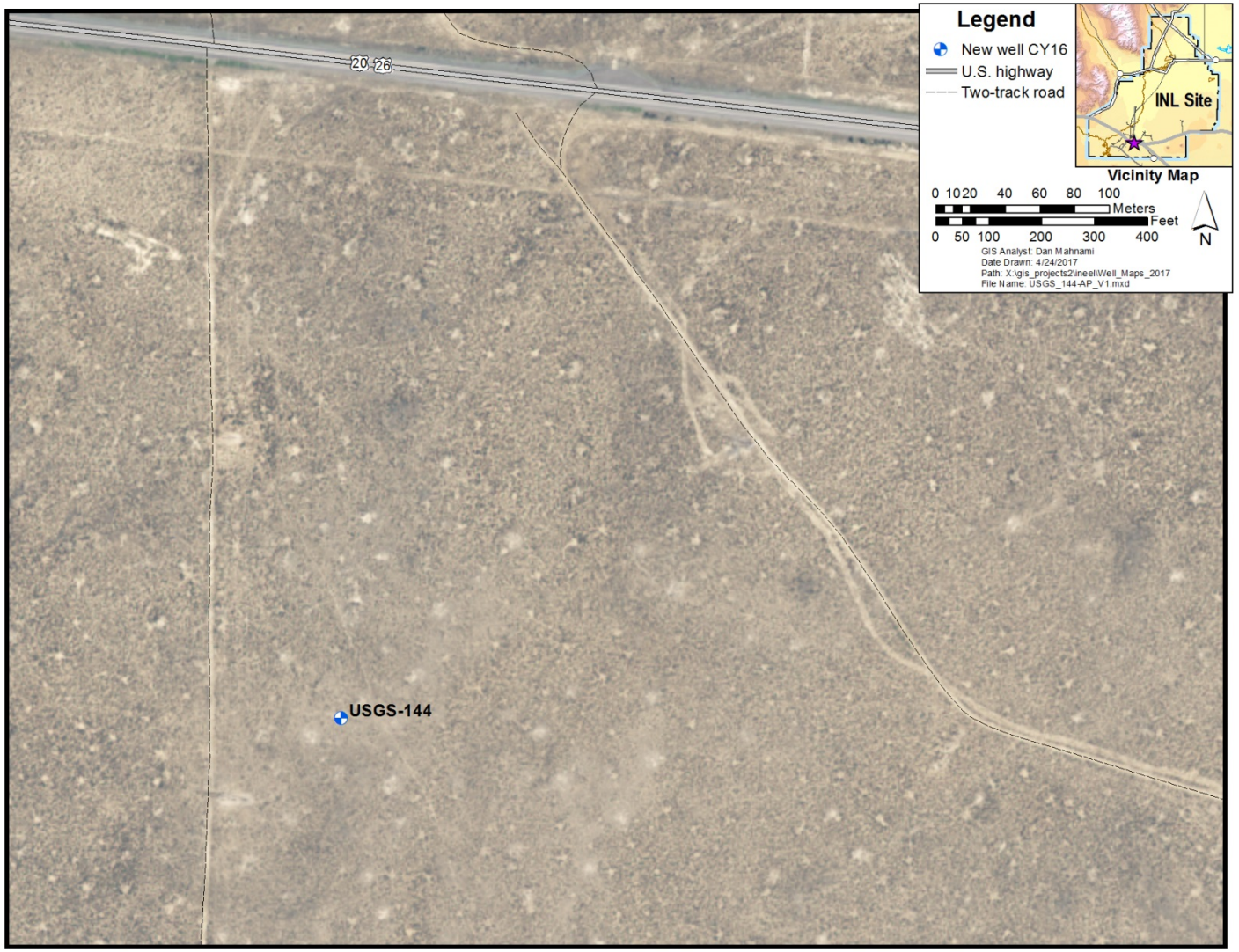
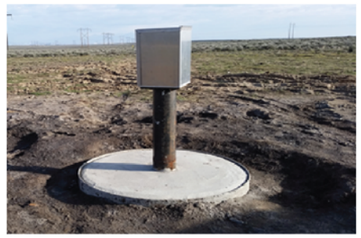
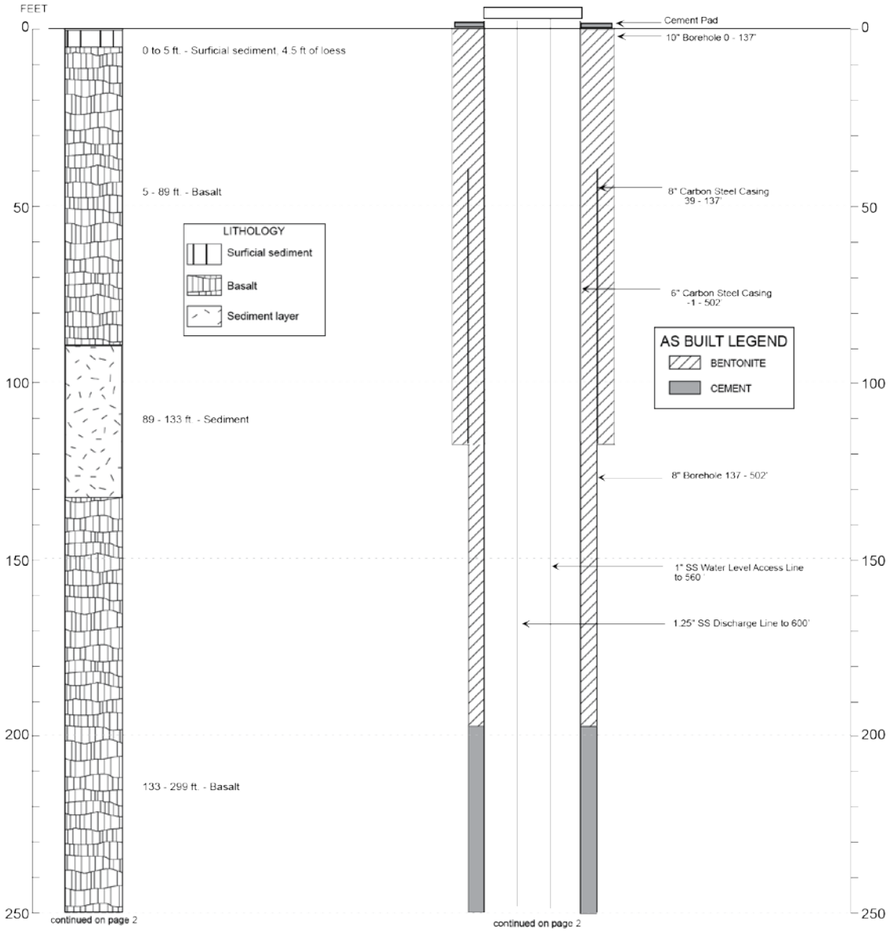


Figure A-6. Map showing the location of new well USGS-144.

WELL NAME: **USGS-144**
WELL ID: **2273**
Facility: INL
Well Type: Monitoring
Well Status: Active
Year Drilled: 2016
Total Depth: 638'
Drilling Start Date: 8/22/2016 Drilling End Date: 12/7/2016
Completion Depth: 638'

Driller: USGS
Geologist: M Hodges
Drill Method: Air/Mist Rotary/core
Drill Fluid: Air/Water
Land Surface: (29) B.C.
(88) B.C.
Water Level: 522 ft bls
Water Level/ Date: 11/21/2016
Water Level Access: Hole





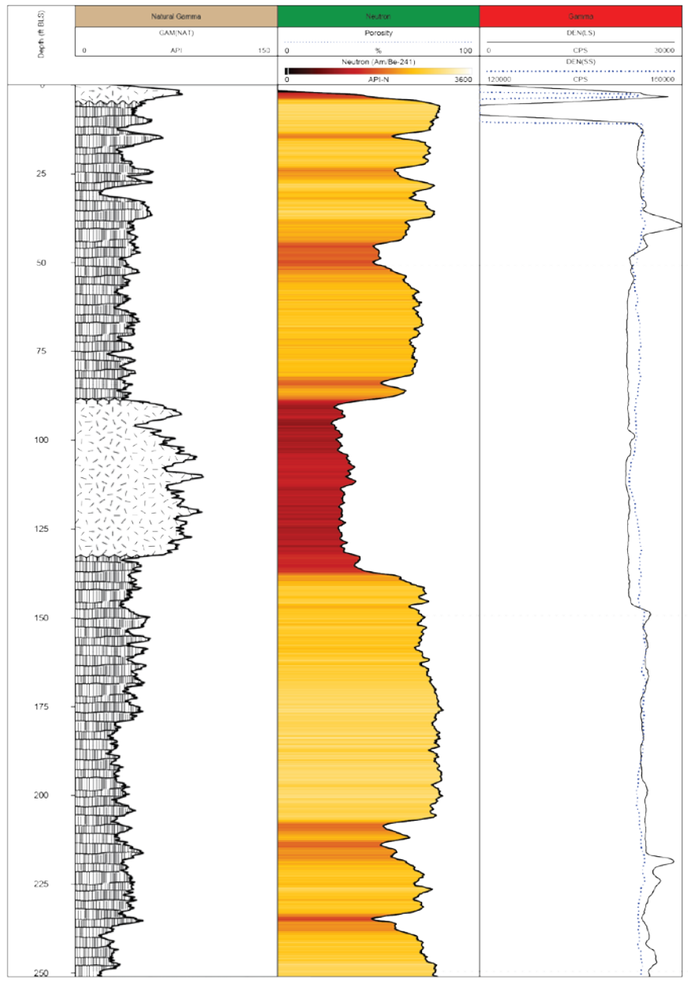
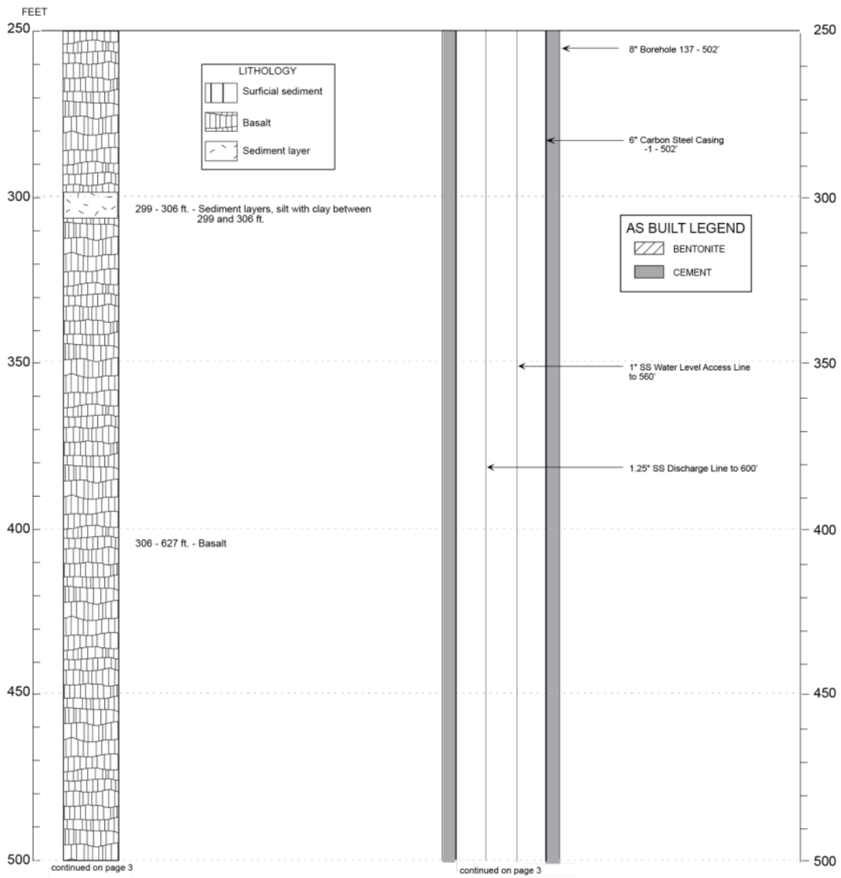


Figure A-7. Construction diagram for new well USGS-144.

WELL NAME: **USGS-144**



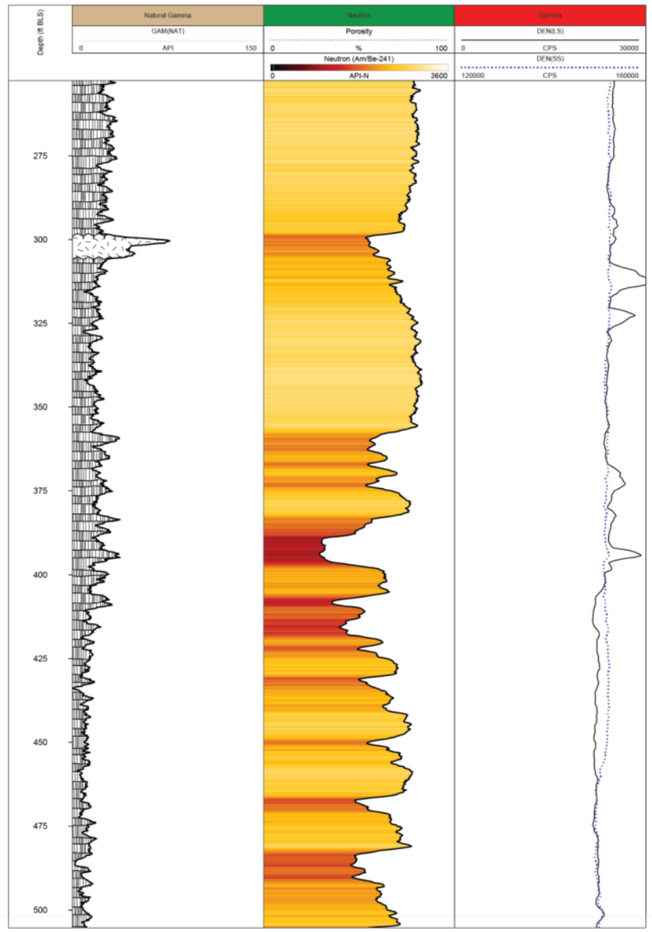
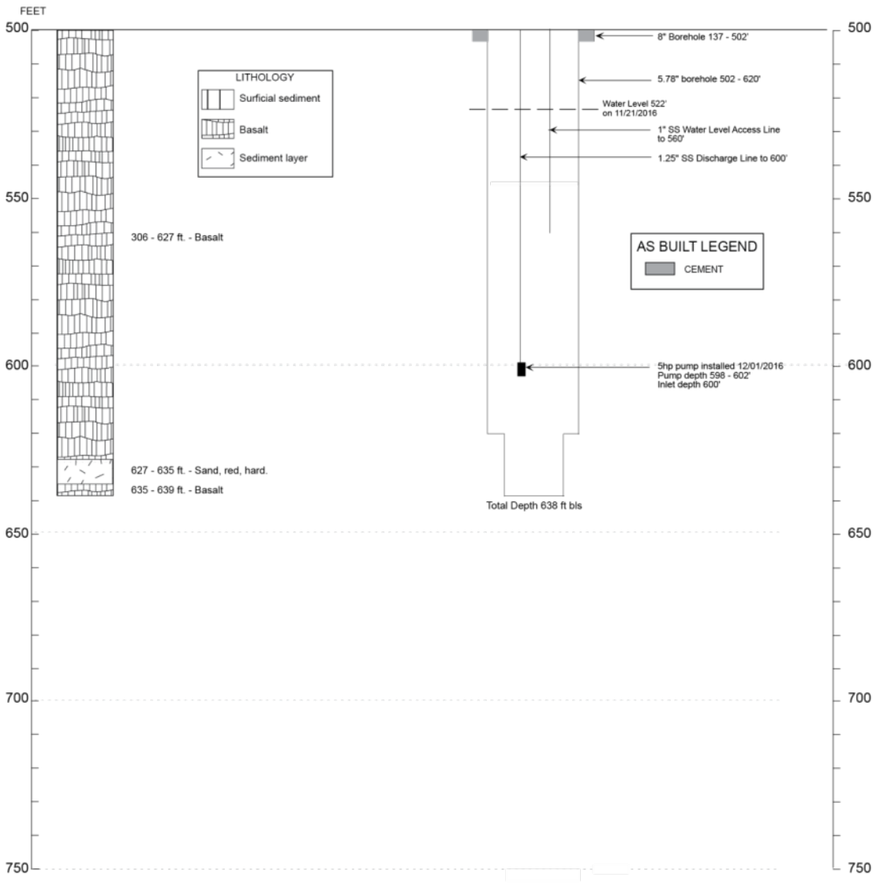


Figure A-7. continued.

WELL NAME: **USGS-144**



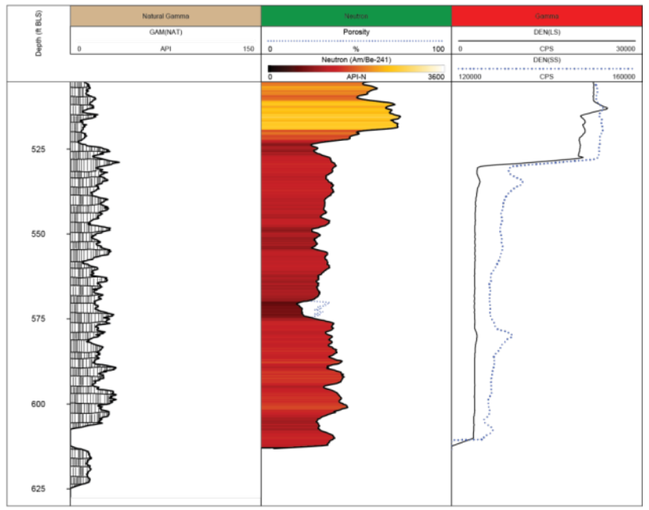


Figure A-7. continued.

Appendix B

Maps and Construction Diagrams for Storm Water Injection Wells Decommissioned in CY2016

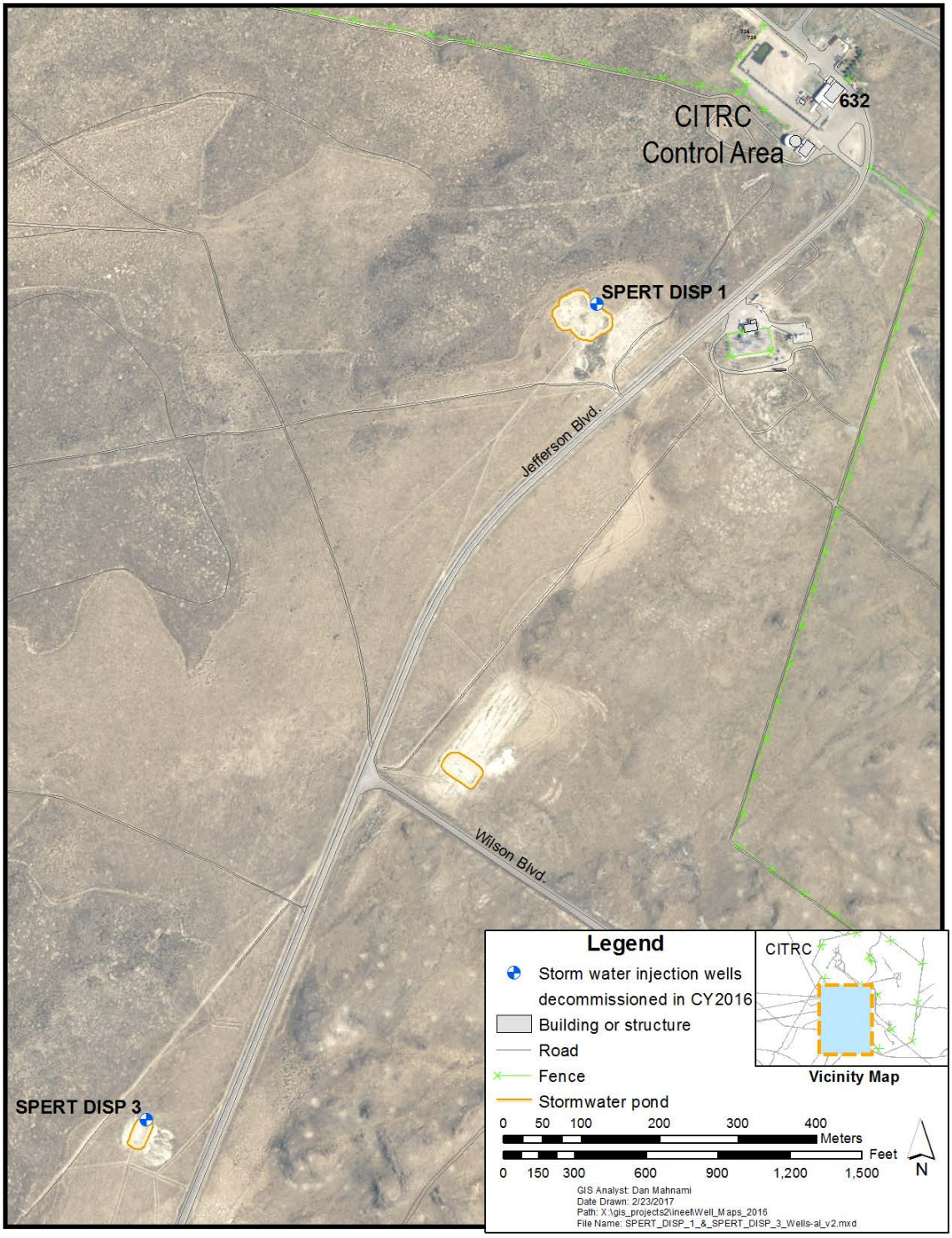


Figure B-1. Map showing location of decommissioned storm water injection wells SPERT DISP 1 and SPERT DISP 3.

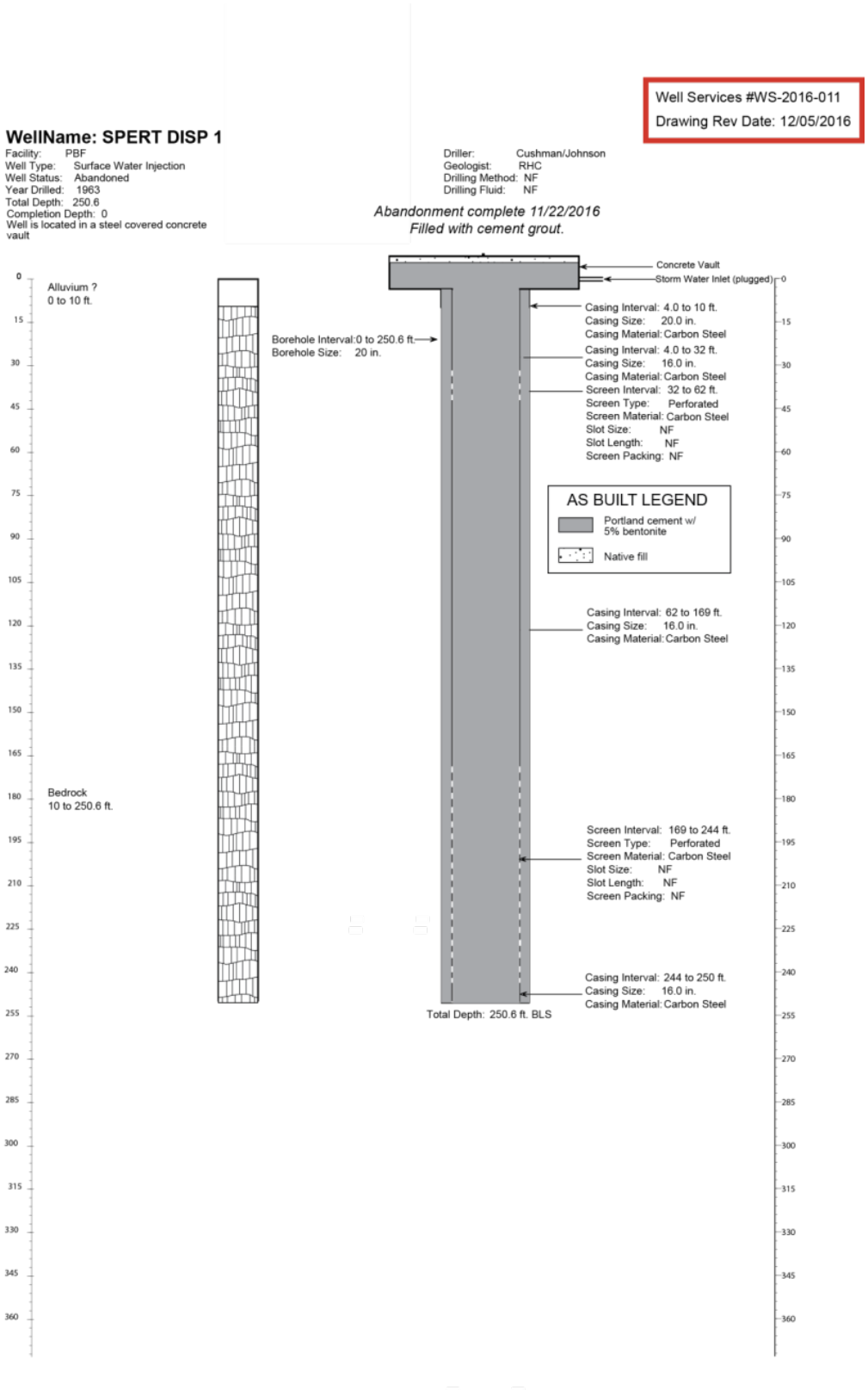


Figure B-2. Construction diagram showing decommissioned storm water injection well SPERT DISP 1.

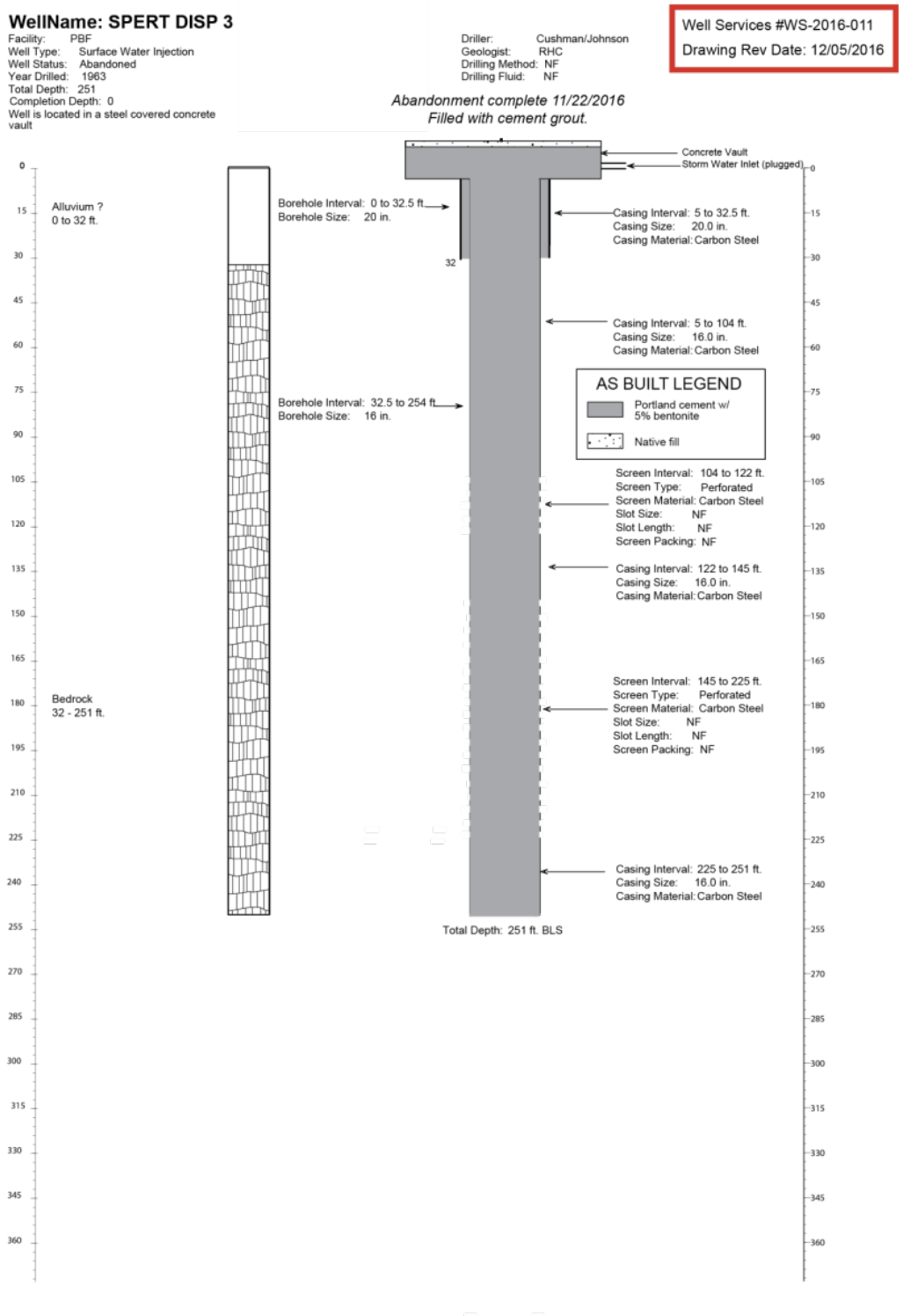


Figure B-3. Construction diagram showing decommissioned storm water injection well SPERT DISP 3

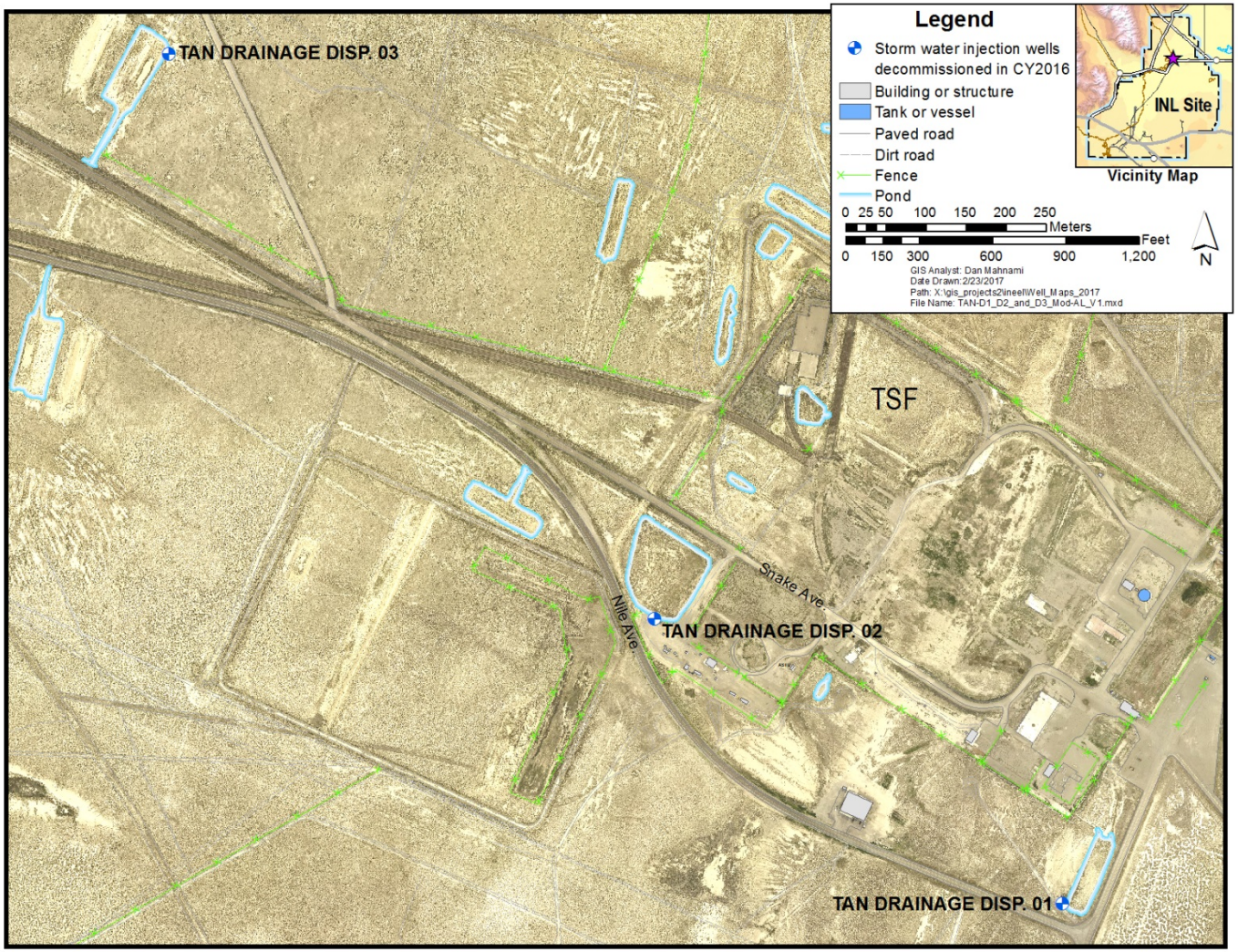


Figure B-4. Map showing decommissioned storm water injection wells TAN DRAINAGE DISP. 01, TAN DRAINAGE DISP. 02, and TAN DRAINAGE DISP. 03.

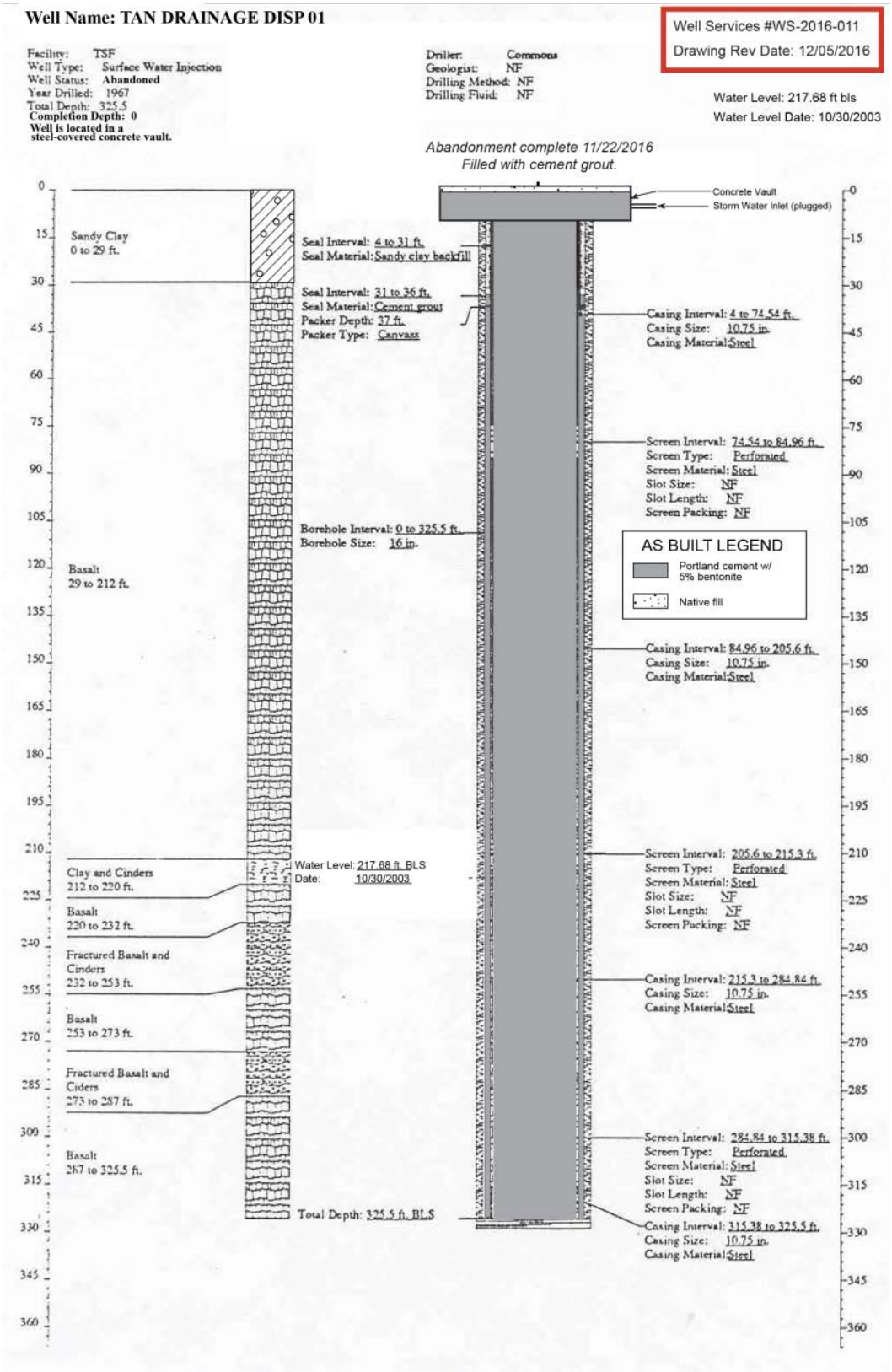


Figure B-5. Construction diagram showing decommissioned storm water injection well TAN DRAINAGE DISP. 01

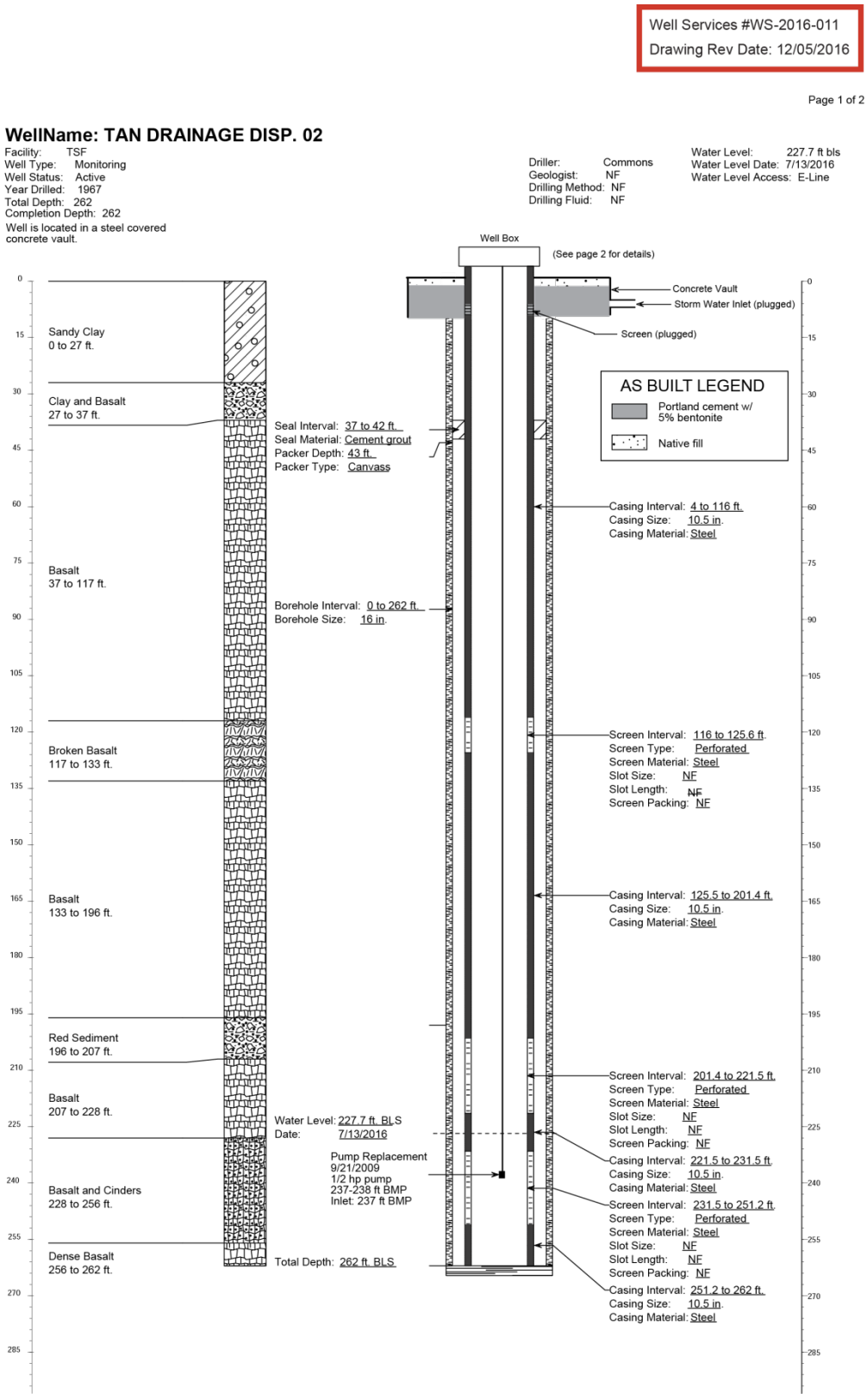


Figure B-6. Construction diagram showing the decommissioning of the storm water injection well portion of TAN DRAINAGE DISP. 02

Well Services #WS-2016-011
Drawing Rev Date: 12/05/2016

WellName: TAN DRAINAGE DISP. 02
Note: Casing was extended in 1999

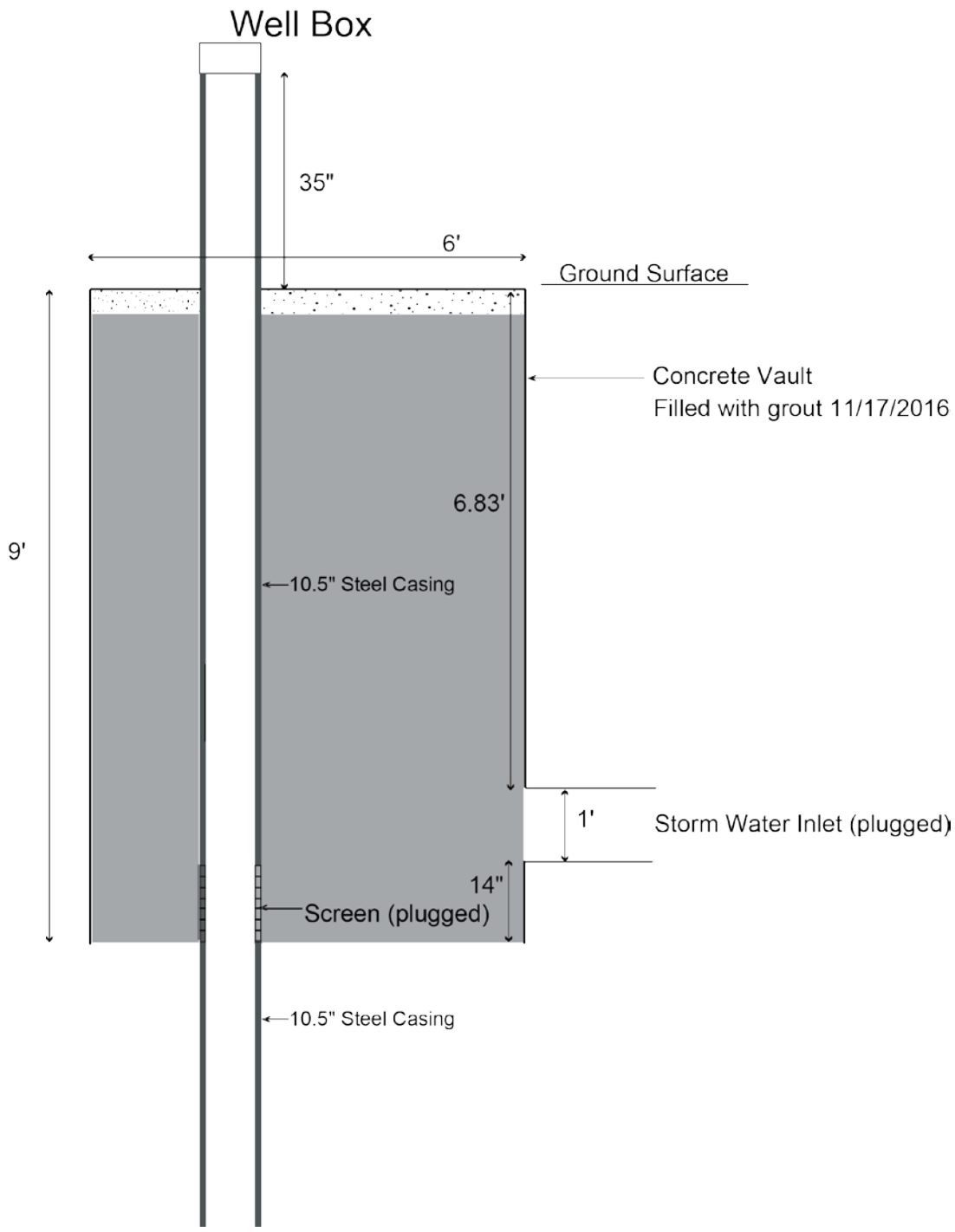


Figure B-7. Construction diagram showing the grouting of the vault and blockage of the storm water inlet pipe of well TAN DRAINAGE DISP. 02

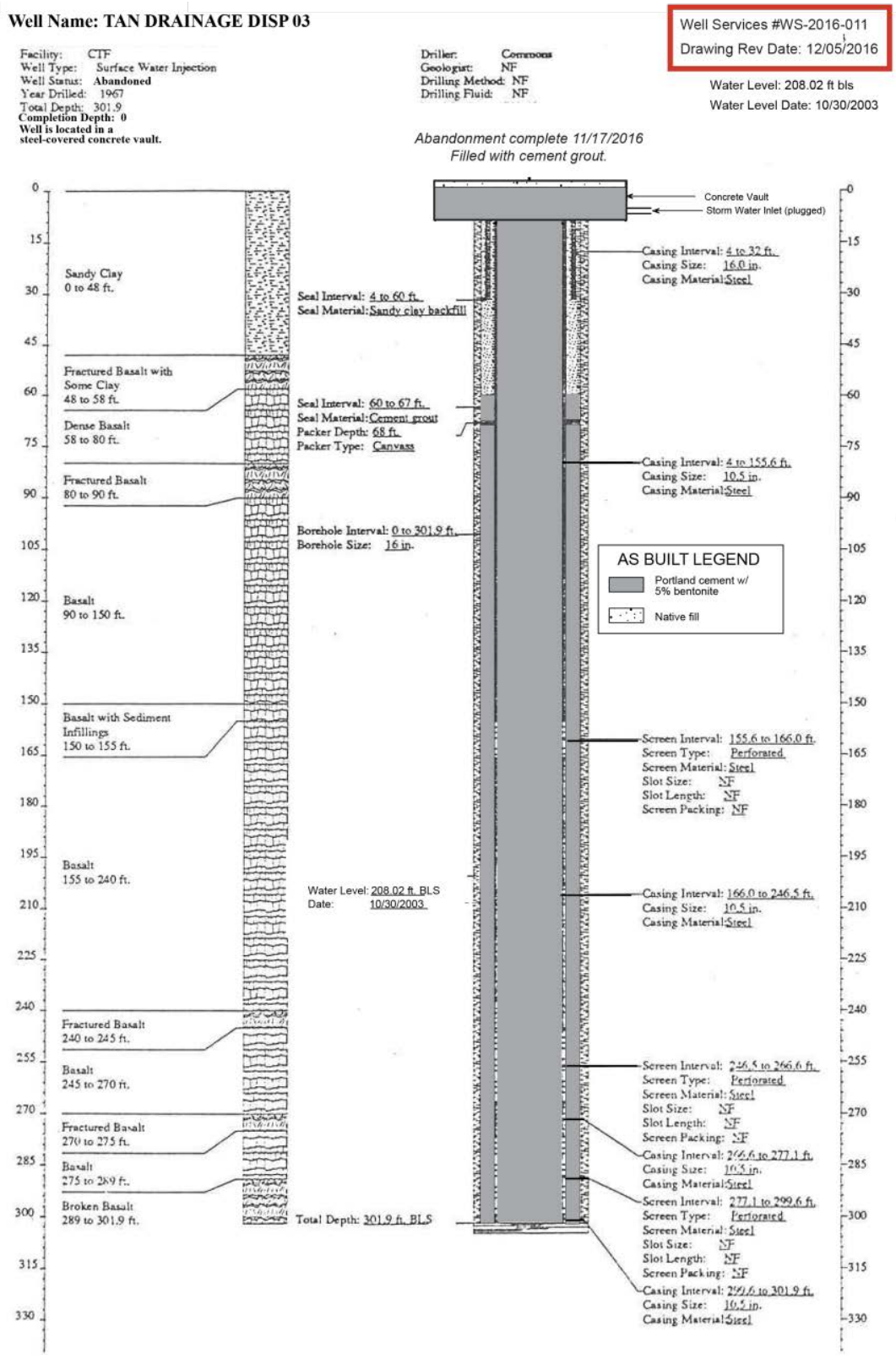


Figure B-8. Construction diagram showing decommissioned storm water injection well TAN DRAINAGE DISP. 03